

SEA DISEASES:

OR, A

TREATISE

Of their

Nature, Causes, and Cure.

ALSO AN

ESSAY

ON

Bleeding in Fevers;

SHEWING

The Quantities of Blood to be let in
any of their Periods.

The THIRD EDITION, Corrected and
much Improved.

By *WILLIAM COCKBURN, M. D.*

Late Physician of His MAJESTY'S Fleet, Fellow of
the *Royal Society*, and of the *College of Physicians*.

L O N D O N:

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To the Right Honourable

The R. H. CHANCELLOR, K.

THE UNIVERSITY OF CAMBRIDGE

The R. H. LORD ARCHBISHOP OF CANTERBURY

SIR THOMAS CLARKE

THOMAS WINSTON

THOMAS CLARKE

The R. H. the Lord Bishop of Exeter

John G. G. G.

The Queen's and the Archbishop of Canterbury



THE UNIVERSITY OF CAMBRIDGE

For the University of Cambridge

To the RIGHT HONOURABLE,

The R^t. H^{on}. Sir CHARLES WAGER, K^{nt}.

Sir THOMAS LYTTLETON, B^{art}.

The R^t. H^{on}. Lord ARCHIBALD HAMILTON.

Sir THOMAS FRANKLAND, B^{art}.

THOMAS WINNINGTON, Esq;

THOMAS CLUTTERBUCK, Esq;

The R^t. H^{on}. the Lord HARRY POWLET.

Lords Commissioners

For Executing

The Office of Lord High Admiral
of Great-Britain, Ireland, &c.

My Lords,

HE First Edition of this
Book was well received
by the Right Honoura-
ble the Earl of Orford,
&c. then Lords Commissioners for

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executing

DEDICATION.

executing the Office of Lord *High Admiral* of England, &c. who had a just Opinion about the Usefulness of *Seamen*, and of the great Defect there was in the Navy in relieving them in their Sickness, even to have a Contempt of that Part of the Service.

THIS Want I thought was chiefly among ourselves, till upon Enquiries I found other Nations labouring under the same Difficulty; notwithstanding of the Endeavours of *Bartholin*, and *John de Vigo*, the last appointed, to clear up this Obscurity, by Pope *Julius II.*

IN this Performance we find the *Scurvy*, *Fevers*, and *Fluxes*, a *Di-*
arrhœa

DEDICATION.

arrhœa particularly, and a *Dysentery*, the most genuine Diseases at Sea; and, with Pleasure, I dare assure your *Lordships*; that your *Surgeons* are led into the *Nature*, and Cure of these Diseases more distinctly by this Book, than they can by any other Assistance they can find, as more fully appears in the *Preface*.

BUT as *Fluxes* make the most notorious Havock among Men in *Navies* and *Armies*; which has never been opposed, but by the Medicine invented, and encouraged in our Navy; so the Guardianship of the *Lord High Admiral*, will always be wanted, that this *necessary* Medicine is not lost at any
a 3 Time

DEDICATION.

Time by neglect, after it could not be destroyed by Malice.

THE great Want of a Medicine of this Kind was first * represented, in Conversation, by the late Lord *Berkeley* of *Stretham*, and administered, next Day, to Numbers of Men on Board the *Sandwich*, commanded by Rear-Admiral *Meese*, then her Captain in 1696, and who made one of our Company.

THIS desirable Success was soon known in the Fleet, and its Efficacy soon confirmed in several other Ships, without any other Design, on my Part, besides the doing my Duty.

AT

DEDICATION.

AT this Time, Sir *Cloudesly Shouel* was sent for to Town, to receive the Command of a *Squadron* for the Mediterranean, before the Beginning of the Winter; who desired I might accompany him in his Expedition, for many obliging Reasons; but particularly, because I had practised a Medicine in the Fleet, which was an absolute Cure of *Fluxes*, a Distemper that destroyed the Seamen; in these Seas especially. All this was agreed to by the Earl of *Orford*, &c. Lords Commissioners of the Admiralty, and Sir *Cloudesly* was ordered to purchase a Quantity of the Medicine.

THE Fame of the Medicine spread every where with our *Fleets*,

DEDICATION.

and single *Ships*, and in 1698, the *French* Officers experienced this Efficacy on themselves, when the late Lord *Aylmer* commanded our Fleet in *Cadiz-Bay*; and Monsieur *Poussine*, their Envoy at this Court, had Orders to purchase the Composition and the Method of practising the Medicine: But the second War breaking out soon after, he was ordered forthwith to leave *London*, so I never received his Proposals.

THE last Example of this Nature was in 1731, when the present *Pope* was cured by the Medicine, and was brought from the *Fleet* by a *Roman* Abbot, when it was at *Leghorn*.

BUT

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BUT nothing brought greater Honour to the Medicine, than a scandalous Trial, that was pretended to be had of it, nor any Thing, 'tis to be hoped, has put it more out of the Power of such Attempts for the future. It is sufficient to me, that this Trial was thought so by proper Judges. The Earl of Orford and the other Lords Commissioners, then being, heard me, upon my Memorial, in the civilest Manner, about the proper Purchasers of the Medicine, and how the Navy might not suffer by being deprived of this useful Medicine. One Article was fully settled; but soon after there was a Change of that Commission.

THE

DEDICATION.

THE Earl of Berkeley, with the other Lords Commissioners, who succeeded the former, resented lively the great Abuse of the Navy, and of its Officers, by the Manager of the Trial, and proceeded in the same Design of securing the Medicine against further Attempts, as far as human Wisdom can provide, by sending their Orders to the Principal Officers and Commissioners of the Navy, that all his Majesty's Ships, that are to be fitted out for the Meditcranean, or the Indies, be furnished from Time to Time with the same Proportion of Medicine they were formerly supplied with.

Now

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NOW, my *Lords*, who can question the Usefulness of a Medicine that has been, every where, notably successful for near forty Years; which Success has been attested by all the *Lords Commissioners* for Executing the Office of *Lord High-Admiral* in all that Time. Such *Experience*, and such Testimonies, must always silence any mistaken *Economy* of a Trifle against the saving a Seaman's Life.

BUT, my *Lords*, as the whole of the Performance of the Sea-Diseases are of the greatest Importance, I hope your *Lordships* will give it your Protection, as all
your

DEDICATION.

your brave and wise Predecessors
have done. I am With great Re-
spect,

My Lords,

Your Lordship's most Humble,

and Faithful Servant,

W. COCKBURN.



P R E F A C E.



HIS Treatise of Sea-Diseases has every where, found so favourable a Reception, that I am under the Necessity of making it as perfect, as a Work of this Kind requires; because I would prevent its spreading with some Defects, which are easily supply'd, and redressed. The French Editors do not complain; but the great Civility of their Esteem, justly commands my best Endeavours to render my Performance more worthy of it.

Did not the Physicians in France judge, at all Times, perfectly well in all Matters of Literature, and often in-
struct

struct others by their Discoveries, I should have believed that the great Success of Dr Bidloo's Performance, or the determining Praises of the most learned, and the most candid Professor Boerhaave, might have given a Bias to the Translator of our Book into French. But I hope they will pardon me, who have had too great a Share of their Esteem, in the most publick Manner, upon another occasion, to seem to suspect their Judgment in any Respect; which should impeach my Gratitude, and my Judgment at the same Time.

The late Professor Bidloo took the Trouble of putting the Sea-Diseases into Dutch, illustrating, in his Notes, the Truth of my Proofs with some parallel Examples from his own Experience. This Love of his Countrey procured him an Accession of Favour from the States; tho' that was already so great as scarcely to admit of any new. They, without any farther Delay, ordered every Surgeon in the Service to be forthwith provided with a Copy of the Professor's Book.

My

The PREFACE.

KV

My Book coming into the World, with so great Advantages, found many thousand Readers in Germany; besides those in Denmark and Sweden, where a maritime Strength is to be supported: The former, tho' far removed from the Sea, finding Fevers and Fluxes make great Havock in Camps; and which never could be restrained; but what are now like to yield, in a great Measure, to this Auxiliary, the Book of Sea-Diseases, and gave the new Guest a very favourable Reception.

Dr Boerhaave, the famous and learned Professor of the Practice of Physick, in the University of Leyden, has not concealed his Esteem of my Performance, but has taught publickly, in his Schools, my Doctrine of the Scurvy, liberally commending the Treatise and it's Author; a Piece of Generosity altogether owing to his own superior Learning.

But, to look nearer Home, the late Dr Freind, who attended the Earl of Peterborough,

borough, as Physician to our Army in Spain, generously acknowledged the great Assistance he reaped from my Book in his Practice in that Country, and acquainted me in a Letter, dated Septemb. 9, 1706, from Barcelona, how great a Conformity there was between the Diseases of the Fleet, and of the Field; as had been every where observed by most of the Camp-Physicians. He does not indeed mention the Scurvy, a Disease more peculiar to Navies; but, speaking of the other two Diseases, says, *Hi qui vel Classem vel Exercitum infestare solent longè frequentissimi sunt Febris et Dysenteria: Ita ut nec in Mari nec in Castris versari possumus, quin hos Comites ferè perpetuos, et quasi indigenas habeamus.*

The Scurvy being generated by the Salt Provisions, altogether unavoidable at Sea, makes one of the constant Diseases in Navies, and is the Reason why it seldom appears in Camps. On the contrary, the putting the Seamen ashore,
off

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off of the mentioned Diet, proves their absolute Cure. This was very conspicuous in 1695, when we were to be one Month in Torbay. I then persuaded my Lord Berkeley to have Tents made ashore for the Men that were most afflicted with that Distemper. His Lordship objected, that the Men would desert the Service, but after considering their being absolutely useless, he had Tents set up in the Bottom of the Bay, and above an hundred were put ashore, perfect moving Skeletons, scarcely able to get out of their Ships; they had fresh Provisions allowed them, with Carrots, Turnips, and other green Trade. In a Week they were able to crawl about, and, before the Fleet put to Sea, they returned to their Ships, not above two or three leaving the Service.

'Tis true, some Northern Countries, bordering on the Sea, are more afflicted with the Scurvy than those who are remote from it, as Pliny long ago has informed us, in the 25th Book of his

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Natural

Natural History, Ch. 3. *It was called Stomacacon, because of the falling of the Teeth, and other Symptoms that infested the Mouth: Nor were the Natives left without a Remedy, which the People of Friesland showed the Romans, who encamped there at that Time, and was called Britannica, a Remedy, says Pliny, not only useful in Diseases of the Mouth, and of the Nerves, but against the Biting of Serpents, and the Quinsey. About Norway the same Disease is felt, who have their Moltibeer, &c.*

In the Book of Sea Diseases we find great Satisfaction given to Dr Boerhaave, and learned Physicians, on this Subject. Besides, our Surgeons are instructed in the Nature of the Scurvy, and are conducted into the Methods of curing it.

Fevers and Fluxes, the other Diseases that occasion great Destruction in Navies and Camps, are little understood

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stood by Physicians and Surgeons; yet, in the Performance before us, the Symptoms of Fevers, that appeared among us, are so particularly described, and the Method of Cure is so well adapted to the different Circumstances of those Fevers, that the Surgeons of the Navy have been led into a most steady Practice, and the different Doses of Medicines, employed in the Cure, are perfectly well determined, notwithstanding that the Theory and Practice of Fevers are among the great Desiderata in Physick.

The Variety, indeed, of Fevers is so great, that their Numbers are only known to the most learned Physicians; and not any one knows any Thing of their Nature. How often do Physicians betray their Want of Reading on this Occasion, and how easily may they be convicted of their Unskillfulness. In 1718 the Low or the Slow-Fever was an unheard of Disease in the Opinion of many eminent Physicians, and a Disease so new to them, that they could not give it a particular Name.

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The Disease, nevertheless, was perfectly well described by the ancient Hippocrates, and has had a Place in the Books of the Physicians down to our Countryman, Dr Willis.

If this is truly the Case of the greatest Number of Fevers, how shall Physicians consult about their Sick, without a proper Name to express their Symptoms; and without them, can they possibly enter into the Nature of the Fever, or form the Method of curing it.

Besides, the variety of Fevers is infinite, nor can that be reduced within it's proper bounds, but by the Method that gives you the Nature of a Fever, universally, from it's Symptoms, but what adds to the Confusion. Fevers associate themselves with every other Disease, and elude the Method of Cure of the Disease, that, without a Fever, had been found generally successful.

The

The learned Ramazzini, Professor of Practice of Physick at Padua, considering the various Appearances of this cruel Disease, breaks forth: Habent Ætates suos peculiare Morbos, suos Sexuum Diversitas, suos varia ac diversa Anni Tempora, de quibus magnus Hippocrates, suos quoque varia Vitæ Conditio, et exercitii Genus. Febri non vacat talia minutè distinguere; nulla non Ætas Febri victima jugulatur; non Infantilis, non Senilis. Nullis itaque legibus adstricta est Febris, imò penitus exlex, excors, et ex asse tota inhumanitas est.

This is a true Representation of the present melancholy State of Fevers; but tho' they be cruel, and inhuman, they are not without a Law: for in this Book of Sea Diseases, we may find them brought under Rule; a Sort more particularly, that threatened the Destruction of far the greatest Number of Men in that Fleet. Never fewer
b 3 sick,

sick, in the Duchefs, in 1697, than an Hundred; tho' we buried half a Dozen every Morning for the first six or seven Days. Had the Fever gone on destroying in that Order, in every Ship of the Fleet, we very soon should not have had Hands to sail the Ships. But I quickly got into the Nature of that Fever, and found a Remedy aboard the Ship; which gave me more solid Pleasure, than to any one besides. But this History is fully related at Page 147, and some following Observations; which makes it unnecessary to proceed further with this Subject at present.

*Fluxes are, very near, as intrac-
table as Fevers, being less known, at
present, than in former Times; many
Distempers bearing their Name, tho'
their Symptoms and Appearances are
vastly different. And therefore we must
not wonder, that the Practice for
Fluxes has not improved these three
thousand Years, excepting what Corn.
Celsus has informed us about purging
Medicines,*

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Medicines, near 1800 Years ago. Our Knowledge, in this Particular, is so very low, that we are scarcely sensible of our Wants; and Physicians wait rather what Chance will throw into their Hands, than have any Skill to invent a Medicine, or to administer, properly, the few they know.

We were religious Adorers of a Specifick, the Ipecacuanha, as well as the French, for half a Century, and it is stupendious with what Delicacy we have here addressed that Shrine. This Specifick was supposed to cure every Flux, and we believed it with that Implicity; that Nobody presumed to ask how? And in what Manner.

The French have been cured of their Credulity for some Years, and the greatest Bigots are now offended, in Proportion to their former Confidence they placed in it; while others are not for carrying Matters to Extremity,

b 4

but

but rather to employ it, where it may be of any Use.

Dr de Jussie, Professor of Botany in the Royal Garden in Paris, on that View, read a Memoire in the Royal Academy of Sciences in 1729, shewing that Ipecacuanha was still useful in the Cure of some Kinds of a Looseness; though it had been miserably misapplied in others, where it could not be of any Use; which had occasioned the Disgrace it had lately fallen into: But after all, that the best Effect of Ipecacuanha is by it's being a Vomit; and thus we are carried as far back as to Hippocrates, who recommends this Operation: For, says the Doctor, it then clears away crude and indigested Stuff out of the first Passages. On the contrary; when Ipecacuanha is given against an Hepatick Dysentery, or against a great Discharge of Blood upwards or downwaads, (often occasioned by a purging Medicine that was given for the Cure of a Looseness)

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ness) no Success can reasonably be expected from the *Specifick*.

But the Ipecacuanha was, in all that Time supposed to cure Bloody-Fluxes, by some innate and specifick Quality in itself for that Purpose. This I always disputed, and proved, in 1718, in my Book of Fluxes, dedicated to King William III. of ever glorious Memory, that Ipecacuanha was useful only as a Vomit, in the same Manner as the Salt of Vitriol had done an Age, or two, before Helvetius brought his Remedy into France: All which I confirmed, by observing that the Ipecacuanha was never found to have any Success among the French, either in their Fleet, or in their Army; tho' it was purchased with a good Sum of Money for that Service.

*Dr de Jussie informs us of the great Expectations the French have from Simarouba, a Root brought from Cayen in America: But we have
not,*

not, in six Years, had any further Account of it. In the mean Time, it is very plain how sincerely the Physicians in France acknowledge their Want both of a good Method, and of good Medicines against Fluxes, and their industrious Searches after them are highly to be commended. We do not complain but exult still on our poor Stock, of Ipecacuanha, and the pretended improvement of the Diascordium of that excellent Physician Fracastorius.

The Misapplying of Medicines will render the best unsuccessful, as Dr de Jussie has observed; the more Chances there are for such Misapplications, the Difficulty of succeeding is the greater: But as the Doctor has only mentioned the ill Success of misapplying a Vomiting Medicine, many greater Difficulties arise from our Ignorance of the Disease, and of its Cause, besides these that arise from the Medicines, commonly, employed in curing Fluxes. This Consideration induced me to write
the

the Discourse about the Difficulty of curing Fluxes in the Philosophical Transactions in 1733.

Diseases have been so well described for three thousand Years, that nothing, besides the grossest Ignorance, can account for Physicians mistaking one Disease for another. A Tenesmus is often called a Looseness, and we often hear, among some of the best modern Authors, of a Dysentery without Blood; of a Bloody-Flux without any Flux, and several Blunders of this Kind.

But as the Nature of Fluxes was altogether unknown, I proved, in the mentioned Discourse, that a Looseness, universally, is either a quicker Conveyance of the common Quantity of concocted Food, and of the Liquors commonly mix'd with it, in the Guts; or else, it is a greater Secretion than ordinary of a watery Substance, from the Blood, into the Guts.

If

If we then consider, that vomiting, purging, and binding Medicines have always and only been employed against Fluxes, it is very evident, that they have no Place but for the first: For a little Blood mixed in with the Stools, which constitutes a Bloody-Flux, makes no Exception to what I alledge. These Medicines are often misapplied, and their Doses not being duly proportioned, occasion their ill Success; especially when the Stimulus, that produces the Looseness, is from the Piles, an Ulcer, or a Stricture in the Guts, and then it is never to be cured by the common Medicines, which either increase, or stop, the Looseness too soon. Thus Physicians can hardly avoid misapplying their Medicines, the distinguishing Signs of these Causes being still unknown.

*The last Species of a Looseness is so far from being helped, that it is hurt by the Practice of the fore-mentioned Medicines, and Physicians are left without a Remedy for the worst
of*

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of Fluxes. Cœlius Aurelianus, a most accurate Observer of Diseases; and Rhaza, and Avicenna, among the first Rate of Physicians, blame the free Use of Purges and Vomits, in this Kind as also in the Former.

In later Times Petrus Salius Diverfus, a most approved Physician, declares it to be in vain for any Physician to attempt the Cure of it, and Lazarus Riverius, after trying all the Methods in common Use gives us no better Hopes of a Cure. Nor have any other Physicians met with better Success, and binding Medicines, the great Dependence of Physicians, always increase this Looseness, instead of restraining it; which may seem a Paradox to many Physicians.

The only Medicine that can any Way promise Success, is the Diascordium Fracastorius invented against this Flux and Fevers, then raging at Trent in Time of that Council; but which is altogether
spoilt

spoiled by our pretended Amendment of it, and purges as much as any Astringent.

The Cure of Fluxes, in the Navy, is the Reverse of this, the Medicine being happily administred in every kind, by proper Changes of its Doses only, and with some small Help, as in the Watrey Loosness; is so direct, as if it were designed for any one of them, without having any Regard to the other.

*Thus the Efficacy of the Medicine, and the Universality of its Use is put out of Doubt, and all other Fluxes, depending on the Piles, Ulcers in the Guts, &c. may be cured by proper Assistance, as in the Case of Watrey-fluxes. As these are not so common as the former, the Navy-Surgeons have no Directions about curing them; whereas the Method of all other Fluxes is so plainly ordered them, that they cannot misap-
ply*

The PREFACE.

XXXI

ply the Medicine, whereby they are to be cured.

I might add many Accounts of the Success of my Medicine from the West Indies, from Brasil, the Mediterranean, &c. But as many Histories of that Kind are originally lodged in the Admiralty-Office, I shall forbear relating any of them, to avoid an unnecessary Trouble to my Reader.

THE

The Preface.

THE PREFACE.

I might add many accounts of the
records of my Manuscript from the West
Indies, from Brazil, the West Indies,
etc. But as many of these
were originally lost in the
mill-fire of 1812, I shall refrain
from adding to such an already
lengthy list.

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A N
A C C O U N T
O F T H E
S I C K N E S S E S

That are incident to
S E A F A R I N G P E O P L E.

P A R T I.

TVERY one who has been at Sea, for any considerable time, must be sensible of the Usefulness of this Undertaking, and of the Assistance Surgeons, whose Business is with Seamen, must receive from a Performance of this kind; yet this is the first Attempt that
B was

The Usefulness of this Work.

SEA DISEASES.

was ever made, to any purpose, in any Nation.

THE living at Sea is living in a new World, and the Diet of Sailors is altogether different from what supports Men ashore: Their Diseases too must have other Appearances, and require a suitable Variety in their Cure. When this is duly considered, the bravest Seamen will not despair of their Health, seeing so great Care taken against their perishing, and languishing, with sickness; they have, from their Infancy, been inured to face storms of Wind, and raging Billows; but may now be taught to grapple with Diseases, after a due Provision is made against them.

Never before
undertaken.

HITHERTO the Armament against Distempers has been very defective, since that was formed by People, very Strangers to the Nature of this War. I have often wished for Helps of this kind to enable me to pursue, successfully, my Practice at Sea: but no such are any where

where to be found ; and the Practice at Sea was no more to be discovered, than the Furrows a Ship makes in the Sea : neither of them leaving any Footsteps for directing and informing those who follow them. For my own part, I should as little have ventured upon this Account, as I would have been the first Man that put to Sea, had not the Station of Life, that became my Share, put me upon this easier way of doing my Duty, or of shewing my Endeavours to discharge it. At first, I attempted nothing higher than a *Journal* of my *Practice* ; but the many Particulars that grew upon me, while I pursued this Scheme, gave me afterwards a thorough View into the Course of Nature, and encouraged me to enquire, how far the Diseases of Seamen proceeded from their Diet and manner of living.

Why I did attempt it.

FIRST then, I shall consider the Diseases Seamen are subject to on the account of their *Diet*.

The Method of this Enquiry.

B 2

SECONDLY,

SEA DISEASES.

SECONDLY, I shall remark some different Appearances of the same Disease in the narrow Seas, and in hotter Countries. And,

THIRDLY, I shall illustrate these Observations in particular Examples, drawing from them *Indications* for curing in the several Circumstances of the Distemper.

BUT as we design to discover the Diseases incident to Seamen from their manner of living, we must compare their *Food* and *Labour*, together with the *Air* they breathe; and from thence deduce the Errors in the *Animal Oeconomy* flowing from that kind of Life; which Method will readily lead us into a more particular Account, than if we collected their Diseases, and were to account for them by the Particularities of their Diet; for thus we shall discover more Errors than there is an Opportunity to observe in many years, and
to

SEA DISEASES.

5

to provide against what may not offer to our Observation.

THE Victualling has, no doubt, been established upon a long Experience of what was wholesome, and what could hold good in their long Voyages, or for Ships that are stationed within certain Boundaries, for some time ; and therefore I shall begin with a Bill of Fare of such Provisions.

PORK and *Pease* are the Diet on *Sundays* and *Thursdays*, *Oatmeal*, (*Bur-*
goo) *Butter*, and *Cheese* are their Food every *Monday*. On *Tuesdays* and *Satur-*
days are *Beef* and *Pudding*, or *Beef* only. *Wednesdays* and *Fridays* *Butter* and
Cheese ; or *Oatmeal* and *Pease*, are provided for the Sailors. In all these Days
there is a large Allowance of Biscuit-
bread. All these Victuals are so good
in their kind, that there are none better
in *England* ; and the Quantity of them
is greater than to satisfy an ordinary
Eater. So that whatever may be the

What the
Sea-Victuals
are.

Complaints of a Sailor, in the *Royal Navy*, his Victualling is far better, and his Allowance larger than in any *Navy*, or in any *Merchantship*, in the *Universe*. The *Drink*, provided for the Seamen, is a very good *Table-beer*; bitter, indeed, for keeping it from sowing, and they may drink of it what they please. When, therefore, we review the *Number of Men*, the *Length* of their *Voyages* in *Cruising Ships*, and *Convoys*, with the *Nature* of their *Work*, we must confess, that the Victualling is very well adapted for the Preservation of their *Health*. It were only to be wished, that some other Victualling of fresh Provisions, was made for the Seamen when they are recovering their *Health*, or when they are afflicted with the Scurvy; which would not only be the best Remedy against the last, but what should effectually prevent their falling into it; two Thirds of that Distemper being chiefly owing to the Men returning to the Ship's Provisions, sooner than they are able to do
the

the Service of the Ship. I mention this by the by, because it is mentioned with a sensible Concern by Mr Secretary *Burckett* in the *Preface* to his *Sea Memoirs*, where the ill Consequences of this Victualling are fully made out.

To begin, then, with considering how far Health is supported, or perverted, by this part of the Victualling with Salt Provisions.

§ V. SALT Victuals are known, by Experience, to be the hardest to digest, and consequently the most unfit for a quick, or a plentiful Supply of those Parts that are to repair the Decays of the Body: Besides, an Indigestion of Pork, which is an Aliment of great Nourishment, produces worse Effects than Meats that nourish less, as is manifest by Statical Physick; and therefore gross Aliment made upon the first account, and the quantity of indigested Food that happens in the second Case, do powerfully dispose them to Distempers, which are

This Provision proper in Health.

completed in some Form or Appearances of our ordinary Diseases, according as various Circumstances concur in their Production. This is very manifest, neither is it proper to make it out at greater Length in this Place, it being apparent, by what I have already said, when I treated about Digestion and Nutrition in my *Oeconomy of the Human Body*, and shall be more fully shewn by what is farther to be said on that Subject, in another Edition of that Book. Yet, after all, the Bodies of such working People, not only make the best of this solid Food, and continue long in perfect Health, but it also seems necessary for those who are obliged to undergo so great Labour; for tho' the Stomachs of sedentary People, and of those who use little or no Exercise, are scarcely able to reduce such solid and parched Food into Chyle after twelve or fifteen Hours, and when that is done, this Chyle being gross, and with great Difficulty performing its first Voyage thro' the Lacteal Vessels, affords

affords but a gross Supply to the Blood, and therefore must dispose such People to Dropsies, Jaundice, and other Cachectical Diseases: Yet things being quite otherwise with our Sailors, and in one part of their Business or another, scarce one Muscle of the whole Body being left unemploy'd, their Digestion and Nourishing not only go on as well with them in this sort of Diet, as it does with the former People with more delicate Food; but this way of Victualling is even necessary for their Toil and Labour, that which is finer and more easily digested, being not sufficient, nor any way proportion'd to their Work.

§. VI. IT is manifest, from what ^{The Consequences of this Victualling.} has been said, that the greater the Work and Labour is in this Way of living, the Digestion and Nutrition will be the better perform'd, the Motion of the Blood will be the more natural, and the Health of the Sailors will be the more firm; on the other side, the less their Work is, the Hardness of the Food

Food and its Saltnefs, will proportionably have their Effects, and the Indigestion that follows upon the one, and the fiery Heat that attends the other, will be more fenfible and conspicuous. So that all this falls more readily upon the Seamen in the Royal Navy, than upon thofe in the Merchant Service, whose Labour and Work is far greater than that in the Men of War; tho' there is fome fmall Remedy againft that in their other Victualling, while they remain in Health; and to confirm this Obfervation, the People that fuffer moft by Difcafes on account of their Idlenefs aboard the Men of War themfelves, are the Boatfwain's Favourites: For they are over-run with the Scurvy, while they, whom he with full Power and Authority turns out to their Watch, enjoy a fufficient Stock of Health, as do likewise the better fort of them that put themfelves forward by being diligent in their Bufinefs. This lazy Temper among fome Seamen, and moft of the prefs'd Land-men, is the true Original

ginal of the genuine Scurvies that are commonly to be met with at Sea, and which as commonly appear in the following way.

§. VII. **THE Scurvy** appears with *The Scurvy.*
red Spots in the *Arms* and *Legs* especially, which *afterwards* turn *black* and then *blue*, there is an extraordinary *Weakness*, a *Redness*, *Itching* and *Rotteness* of the *Gums*, and a *Looseness* of the *Teeth*, their *Pulse* is very *unequal*, i. e. sometimes *weak*, and sometimes very *great*; all these Symptoms are attended with a great many more not so constant, which are described at large by those that write particularly on this Subject, but cannot be properly spoke to here, since it is not so much my Business to make a thorough Enquiry into the *Nature* and *Cure* of that *Disease*, as it is to find the *Causes*, why it is so easily produced among *Seamen*, that they being sufficiently known, the Hints, here given, may prove useful in the curing and preventing that Distemper.

§. VIII.

§. VIII. AND therefore a very little Consideration will soon convince us, that it is from this part of their Diet that the Scurvy is, as was hinted, produced, and tho' two Thirds of the Number we meet with, fall not into it immediately from a State of perfect Health, but are rather occasioned while they recover of other Diseases; yet this kind of Victualing affects Men in the ordinary way, when they are not able to move, and their Digestion is but weak, for this *Indigestion* in the first *Concoction* must yield a very gross Chyle, which is not easily converted into Blood, after many Circulations, and upon this account *Transpiration* and most other Secretions must be diminished; and thereby the quantity of the *Blood* must be augmented, and that Increase must be in a proportion to this Impediment of Transpiration and Inequality of the other Secretions. Now a quantity of Blood more than what is natural, endued with a proportionable quantity of Motion, and with a greater
Impe-

Impetus against the resisting Sides of Arteries, and the more, that they are inflected, and this Force, by which it falls on these Sides, may be greater than their Power of Cohesion ; and therefore Blood breaking thro' its Canals, will run out in a Quantity that bears a Proportion to its impelling Force, the greatness of the Wound that is made, and the Resistance of the Place into which it falls: So that if the Place be superficial, if any sufficient Quantity is discharged, and the Quality of the Blood so gross, that the perspired Matter is not sufficient to keep it fluxile, by its Quantity and Force ; in that case, extravasated Blood will corrupt after the same manner, and in that very order we find it does, when out of the Body ; regard always being had to the Quantity discharged and the Place where it is lodged, *i. e.* the Blood thus excluded, being in a State of Rest, does corrupt ; and in the different Transitions in the time of this Corruption, is *black, blue, &c.* as we see in the present Case, and others

others of the like Nature. *But it will be longer in corrupting, because of its small Quantity, the Fluxility of the perspiring Streams, and the Warmth of the Place, as might be demonstrated at great length.* By the by, these Mechanical Hints do fairly deliver us from the Necessity some Men are brought under of acknowledging an absorbing Power when they account for the vanishing of those Spots, at a time they are not converted into *Matter*, or *Pus*; alledging a strange sort of Experience, upon which they build this Im-mechanical Notion.

§. IX. It will not prove a very un-pleasing Digression to shew on how sandy a Foundation this absorbing Notion is laid, especially since it may be told in few words. Say they, it has been observed, that Glands have sometimes been found obstructed and filled with a Liquor, the like whereof has been lying in a great abundance in the neighbouring Parts, and from this they conclude, that this

Liquor

Liquor has been suck'd up out of these adjacent Parts into the Glands. I wish they could have discovered by what Machine, Pump, or such like Instrument lodged in these Glands, this Liquor has been drawn up. Certainly it had been more agreeable to the secreting Power, with which we know the Glands are endued, to have concluded that this Liquor, collected in that abundance, was discharged out of those Glands; since this their Power is manifest, and the other unknown. But to proceed.

§. X. IT is known that Standing, Walking, and every Change of Posture, is by the Contraction of Muscles, and as these are more quickly and vigorously performed, we measure our Strength: And when they are done with less Vigour, we say we are weak. Now the Power and Force of these Muscles, are in a triplicate Proportion to the Quantity of Blood in its natural Condition: But the Blood in this Case being viscid, we are only to estimate our

Extraordi-
nary Weak-
ness.

Strength by the quantity of Spirits that can be secreted from it, and therefore the Animal endued with such Blood in a greater Quantity, is but in the Condition as if he had perhaps one half less, and by this smaller Quantity, the quantity of Strength will be proportionably less.

The Spots
are chiefly
in the ex-
tream Parts.

§. XI. MOREOVER, since the Heart is a Muscle, and under the same Laws as other Muscles are, and they being more weakly contracted, because of a less Quantity of Spirits derived into them, so is the Heart likewise : But by the Consent of Physicians, and the Evidence of Reason, the Motion of the Blood is as the Force by which the Heart is contracted, and the Contraction of the Heart being weaker, so is the Motion of the Blood, and this Motion being less and less, the further the Blood proceeds in Arteries from the Heart, in its greatest Distance from the Heart, it is the easier stopp'd and obstructed in its Motion, And because of this ob-

structing

structing Power, and the Power by which it is propelled, the resisting Arteries are broke thro'. It is therefore in these extream Parts, where likewise are great Numbers of the weakest Arteries, that these *Eruptions of Blood* are, and these *black* and *blue* Spots are found.

§. XII. AFTER the same manner is that Inequality of *Quickness* and *Greatness* we find in the Pulse: For the Pulse being altogether made by a greater quantity of Blood that is propelled out of a wider Part of an *Artery* into a smaller or narrower, at every time the Heart is contracted, as has been said; therefore as are the quantities of Blood, and the time of Contraction, so is the Quickness and Greatness of the Pulse; and they being various and unequal, so must the Pulses also be. Here it might be shewn at great length, how this quantity of Blood is variable, and by it, and other Causes, the quantity of Spirits are also variable; all which will also vary, according as Men work hard, or are

C

The Pulse
unequal.
idle.

idle. But this is not a proper Place for Inquiries of this kind : So much may be observed, that as by all these the Blood will be more or less fluid, so it will more easily be propelled, and will secrete a greater quantity of Spirits when it is in this fluid State; *Et e contra* : So that this Contraction of the Heart will be stronger and weaker, the quantity of Blood more and less, and from this different *Impetus* of the Blood, with respect to its *Quantity* and *Time*, arises the Inequality of Pulses; which are *quicker* and *slower*, *greater* and *quicker*, as we find by Experience.

Their Gums
inflamed.

§. XIII. LIKEWISE, this ill State of the Blood, which occasioned Spots and Eruptions in the exream Parts, does in a lower Degree of the same Cause, produce Humours of different Sorts, as the Nature of the obstructed Parts will bear : For this thicker Blood driven thorough larger Capillaries in Places not so far from the Heart, the Origin of its Motion, its Force in them will

will be greater than the Capillary Vessels at the Extremities, and consequently those Vessels will not be so easily obstructed as in the Extremities; yet since this thick Blood does not all of it pass the Vessels in the same time it is impelled into them, as commonly it does, when the Blood is in an ordinary State, the quantity of Blood contained in these Canals is greater than ordinary, and this greater quantity of Blood stretches its Vessels by lengthening their Diameter, which also does enlarge the Dimensions of the Part to whose Composition these Blood-Vessels go, and this Swelling is more or less conspicuous as are other Circumstances joined with it. Moreover, as this universal Indisposition of the Blood does affect universally, while it moves thorough Canals equally disposed, so these Tumours only differ as to the Condition of the Parts that are obstructed; and therefore as the Gums do consist of a Number of none of the smallest Vessels, and they invest Bones, so their Obstruction must more especially

produce Tumours that have the same Colour the Blood has, or Tumours with Inflammation, or, which is the same thing, the *Gums* are *swelled* and *red*.

Rotten and
stinking,

§ XIV. AND as these obstructed Parts are pure Blood, so the common Consequences of such an Obstruction will follow a Gangrene, *viz.* in a total one, and ulcers more or less sharp, with better or worse *Pus*, according to the Goodness of the Blood and Warmth of the Parts where it is generated, as is well known to those that understand how *Pus* or *Quitter* is generated: So that the *Ulcers* in this Case being *foul* and *stinking*, the *Pus* is likewise sharp and corrosive.

And do itch.

§. XV. YET before this total or great Obstruction, the Parts of the Blood being transpired, tho' not perhaps in their natural Quantity, nor in the ordinary Time; but these transpired Parts coming from gross Blood are not well commi-
nuted

nuted, nor so fine as they naturally ought to be ; nay perhaps they consist of very solid and salt Parts, now because of this Grossness and Solidity of Particles, they rub more upon the Sides of Vessels and the small Canals thorough which they are perspired, and by this their Friction excite that Sense of itching, as when a soft Body is drawn lightly over a sensible Part. The Means we naturally take to rid us of the uneasy Itching contribute very much to prevent this Obstruction itself, is sometimes of good Use, and contributes very much to prevent this Obstruction, by which Pus or Matter is to be generated : For by the rubbing of these itching Parts, some of the tender Vessels of the Gums are broken, and the Blood that gushes out, not only leaves more room for the rest of the Blood in the same Canals, but may contribute very much to the better Circulation of other Blood impelled into these Vessels, long after.

The Teeth
are loose.

§. XVI. IN the foregoing State of a Rottenness, or of an Inflammation of the *Gums*, the Teeth must necessarily become *loose*, or fall out, according to the Degrees of the *Rottenness* and Inflammation; for not to mention the *Synarthrosis* and *Gomphosis*, whereby the Teeth are fastened to the *Jaw-bones*; they are likewise kept firm in their Sockets by means of the *Gums*, which ancient Anatomists call *Syssarcosis*. But the first is manifest when Teeth are drawn, or fall out of themselves.

§. XVII. THUS might those Symptoms be more particularly shown, and others proceeding from the same Causes, related at a great Length by Authors that treat purposely on this Disease, be sufficiently accounted for, but this not being my present Design, I hope it is now made appear; how this Sickness is produced at Sea, and upon what sort of Men, and in what Circumstances of Life it is most readily generated; and by

by the by, it is evident, that this Distemper is not easily confounded with the Melancholia Hypochondriaca, as it most commonly is by the best Authors, and that because many Symptoms observed in this Distemper are likewise found in the former. But this Liberty should bring all Diseases under one Denomination, or rather into such Confusion, that we could not distinguish one Disease from another, and is not to be suffered in Authors, especially that set up for pure Observation: For in this necessary part of Physic, the Excellency of Observation consists in a genuine Relation of Symptoms that are peculiar to every Disease, and in truly describing the things hurtful or beneficial; now if it is possible that all the Variety of the Sickness could be thus reduced, there would not be any Use for Observation itself. For instance, we frequently see *Vomiting in Fevers, Scurvies, Iliac Passion, the Stone in the Kidnies, or Ureters, a Fall, &c.* Yet it would be very ridiculous to say, that a Fever is an *Iliac*
C 4 Passion,

Passion, the Stone, a Fall, &c. Or that any of them might be cured by these Means that cure a Vomiting, or that this Vomiting by any of those Ways they observe the other Diseases are cured. This again shows how accurate we ought to be in describing Diseases, and of bringing them into distinct Classes, before we undertake either to cure, or to reason about them. It is very material what that excellent Observer Dr Sydenham has said in the present Case, concerning this Distemper. *Hic enim (says he) Obiter sed & libere tamen dicam, quod licet nullus dubitem quin Scorbutus in his plagis Borealibus revera inveniatur, tamen eum morbum non tam frequenter, quam vulgi fert opinio, occurrere persuasum mihi habeo: multos autem ex eis affectibus (ne plurimos dicam) quorum nomine scorbutum incusamus, vel Morborum Fientium nondum vero Factorum quique nullum adhuc certum induerunt Typum, Effecta esse, vel etiam infelices reliquias Morbi alicujus nondum penitus deviati a quibus sanguis cæterique humores contaminantur,*

tur, &c. By the way, I must observe, that tho' I doubt not but the Scurvy is really to be found in these Northern Countries; yet I am persuaded it is not so very frequent as it is commonly imagined; but that many of those Symptoms (if, not the most) we imagine to arise from the Scurvy, are either the Product of approaching Ills not yet formed into a Disease, or the unhappy Relicts of some unconquered Sickness, which still pollutes the Blood and other Humours, &c.

DR *Willis* has endeavoured to speak distinctly to the different kinds of Scurvies, and calls one of them a *cold*, and another of them a *hot* Scurvy: But in this, contrary to Custom, he has followed the Opinion of the Antients; and in this he embraces their Opinion when not so right, when in other Cases he erroneously forsakes them, and the Truth at the same time: For it is the last only of his Division that deserves the Name, and the other does not really differ

differ from the *Melancholia Hypochondriaca*. I may seem a little too nice, and the Dispute appear as if it lay only in a Name, but what I have said before makes it evident, how useful it is to have proper Descriptions of, and Names for Things, and it is likewise manifest into what Mistakes ambiguous Expressions lead People; which are fatal in the Cure of Diseases: But leaving this Digression, I shall pursue our main Design, in the order it offers itself to our Consideration.

The Bread.

THE next thing I shall consider is their *Bread*, of which every Man is allowed one Pound a day. Moderate eating of Bread has in all Ages been esteemed to contribute very much to the Preservation of our Health, though none have approved of *Quantities*. *Omnis repletio mala, panis pessima*; a Surfeit of any thing is bad, but one of Bread is the worst: Its Substance is tough and tenacious; and therefore is not so easily broken and divided by the Stomach,

Stomach, and if eaten at any time in a greater Quantity, than is sufficient to give a Body to the Chyle, is very apt to make way for Obstructions, and to breed very thick and gross Humours. But an entire Abstinence from Bread deprives the Chyle of that due and necessary Body, that is requisite to make its Passage flow enough thro' the Guts, that it may be the better thrust into the *indiscernible* Doors of the *lacteal Vessels*: And therefore, in such a Famine and Scarcity of Bread, the Body is deprived of those Juices that are made of our Victuals, besides *Gripings*, most troublesome *Loosenesses*, and such other Sicknesses as attend them. Having spoken thus much of Bread, in the general, I shall neither pretend to determine the sufficient Quantities of Bread that are to be eaten, nor enquire whether the Crumb or Crust of Bread are the most wholesome. These Questions are not proper for this Place; since all that concerns us, is the Consideration of the Effects our *Sea Bisket* may have upon
their

their Bodies, who are obliged to make it a part of their daily Food.

FIRST then, a pound of Bread so dry and *solid* as that must be, that it may be the fitter for keeping, if it were brought to the *Consistence* of common Bread, would be near twice as big as it is, while in Bisket ; which I am apt to believe, is a little too much for Men generally to eat. Besides, after it is ground by the Teeth, and sent into the Stomach, it is extreamly hard to be digested, if it be not very fine ; and if fine, it so imbibes the small Quantity of Chyle, that is made of the other Victuals, that the Mass of Blood receives a very small Quantity of it ; and that Mash which passeth the Guts, where the Lacteal Vessels are inserted, is so hardened and compact, that People upon that Diet but seldom trouble the Stool ; which every one knows to be of very ill Consequence, and especially at Sea. From what has been said, it is not only evident that the

above-

above-mentioned Victuals are not fine enough to produce those subtile animal Spirits, that make People so easily advert to, and apprehend at sight, whatever is propos'd; and so, not fit to make Wits: But by the Grossness of their Humours, the Seamen are disposed to most Chronical Diseases, so soon as they are in the least overcome with Idleness and Laziness: Tho' otherwise, all the Inconveniencies that happen, are excessive *Costiveness*, that troublesome Attendant of our Sickneses. So that we may say, that a little too much eating of such Bread, not only thickens the Humours too much, and so disposes our Men to other Sickneses, but immediately produces that troublesome *Costiveness* which is apt to produce many other Maladies, and always obstructs the Cure of Fevers. For when our Intestines are stuffed with a great many days Victuals, they are so distended, and the Blood-Vessels so press'd or straitned, that the Circulation through them is very much interrupted, and not
only

only the Blood that used to flow that way, but even that of the neighbouring Parts, is forced from its Channels, and proportionably filling the Channels of the rest of the Parts of the Body, that have less Resistance, in some degree press the Origin of the Nerves in the Brain, and Blood-Vessels of the Eyes; and so produce that *Stupor* and *Thickness of Sight*, People frequently feel in that Case, and in the Scurvy, when that Disease has been of some standing. Besides, their Chyle must needs be very much interrupted, and kept from being convey'd in a sufficient Quantity for recruiting the Mass of Blood, by the Pressure of the Lacteal Vessels, which are interwoven with the Guts: For the Chyle is forced along the whole Length of the Guts, with the grosser Mass, and so the Body is not only deprived of its necessary Nourishment, but there is an imminent Hazard of Obstructions in the Lacteal Vessels, which very often produce a dangerous Ascites that is seldom cured.

TOUCHING

TOUCHING their *Oatmeal Victuals* Their Bur-
(or *Burgoo*) which of itself is very fit to goo.
correct that Thickness of the Humours
and Costiveness, that are the unavoi-
dable Consequences of the above-men-
tioned Diet, joined with the least Idle-
ness: For Oats being of a thin Sub-
stance, and of all the Grains we use for
Victuals, that out of which the greatest
Quantity of Oil may be drawn, they
not only preserve the Motion that is re-
quisite to make a due Perspiration by
adding Spirits to the Blood, but preserve
it in a convenient Degree of Fluidity;
and by their cleansing Power and Vir-
tue to keep the Belly open: This *Bur-
goo* Victualling is highly necessary for
our Sea-faring-people. Yet, 'tis the least
liked of all their Victuals, because of
the small Allowance of Butter they have
for Sauce to it; and therefore, perhaps,
it were worthy the Consideration of
those to whom it belongs to order this
Supply, and who are every way so care-
ful of the Seamen, to see whether an
Addition

Addition in their Butter might not be allowed; for I am sure, that if that part of the Victualling were made more grateful and agreeable to the Sailors, it would very much contribute to the Preservation of their *Health*. What I have said on this Subject is, in a great measure, applicable to their Pease, which in their own Nature are more temperate than Oatmeal, since they are esteemed by Physicians, and the learned *Galen*, 1 *De Aliment. Facultat. Cap. 21*. A sort of Medium between Things of good and bad Nourishment. And therefore I shall proceed to the next Consideration I propos'd, which was concerning their *Lodging*.

Their Lodg-
ing.

§. XXII. THIS is as convenient, warm, and easy, as may be at Sea, and for such a number of Men; yet what by the pilfering of Hammocks one from another, their lying on Deck, or betwixt Decks, when they are pretty warm after a Can of Flip; and the press'd Mens real Want of Clothes, they

they sensibly contract a Cold, which is the beginning of most of their Miseries. 'Tis not necessary I should demonstrate here the *Way* how that is catch'd ; since 'tis evidently so by that *Heaviness* they complain of in their *Breast*, *Soreness* in their *Bones*, and such other Symptoms, Physicians have determined to be constant Attendants on a Cold. But since I shall have occasion afterwards to treat more particularly of this Subject, I shall at present content myself with putting you in mind, that I have already demonstrated in another Place, and have put it beyond Exception, in the Judgment of very many, that *there is no Power in the Air*, different from its *Weight*, or *Gravity*, able to produce those Symptoms that are said to follow upon obstructing, or shutting up the Pores, when we *catch cold*, and is a common Cause of lessening the Perspiration, and of generating many fatal Distempers, which are needless to be insisted upon in this Place ; since the thing is generally agreed upon ; yet I

D cannot

cannot forbear observing, that an untimely Use of *sweating Medicines* in some, and *thickning Loxenges* in others, is more frequently the productive Cause of Fevers, Pthificks, &c. and of a more fatal Consequence than a Cold could have been, if left to the *Strength* of the Blood and *Abstinence*, without employing any other Auxiliaries ; but more for the Confirmation of this may be easily collected from what follows in this Discourse. I say then, since so much is already clear ; and because too the Force of the Perspiration is only kept up by a certain *Impetus* and Degree of the Velocity of the Blood, and *that* is only interrupted by the Falling or Diminution of *this*, it would be an easy Task to give a more genuine and conceivable Account of catching Cold, than is generally assigned to be done by (I do not know what) Nitro-fity or nitrous Power in the Air ; which upon various Occasions Authors make use of for making the Blood both fluxile and tenacious, two very different Effects ; tho' it is not fit for either, as I have already

ready proved in the *Animal Oeconomy*. But I shall content myself, at present, with enumerating those Symptoms that constitute the Essence of a Cold, and then proceed to consider the Effects of this, by the different Symptoms that naturally attend it.

§. XXIII. SINCE then, I find, it is agreed on by all Physicians, that Perspiration, when we catch cold, is not free as in a natural State, but is interrupted; and a great deal of the Liquor, commonly separated that way, is detained in the Mass of Blood. That which is so detained will proportionably increase its Bulk, and fill the Vessels, which become the Source of all those Symptoms that are observed to attend a catch'd Cold, and that necessarily, as I shall afterwards have Occasion to demonstrate. The Symptoms that appear usually in this Case are the following, which show themselves in this Order. First, a *Weight* or *Heaviness*, a great *Feebleness* over all the Body, sudden *Weak-*
D 2 *ness*,

ness, a *Coldness* in all the *Extremities*, except the *Brain*, a Pain in the *Bones*, and as when one is bruised, a *weak*, *rare*, and *depressed* Pulse? sometimes these Symptoms are attended with *Sleepiness*. In a day or two, the *Pulse* is *great* and *strong*, they become very *warm*, *restless*, and *thirsty*, their *Tongue* is *dry*, *black*, and *rough*, their *Breathing* difficult, and their *Breath* is *hot* like Fire. They are *delirious*, and cannot sleep, and their *Sickness* ends by *Sweating*, an *Hemorrhage*, *Looseness*, &c. or in *Death*.

§. XXIV. THE recited Symptoms being those that appear most constantly in Fevers, in our narrow Seas, and in this very Order they stand now related; I shall endeavour to shew how they may proceed from an Interruption in Transpiration, as I lately hinted: 'Tho' afterwards it will be put out of Dispute that there is really such an Interruption, and such a Quantity of retained Steams, and sometimes of other Liquors, as seem here to be required to explain the mentioned

tioned Symptoms. When this is done, the assumed Hypothesis of an Interruption of Transpiration, when a Man gets Cold, for producing the Symptoms of a Fever, will be no longer begg'd and precarious, but a real Truth, and a true Principle from which these Conclusions are rightly deduc'd, and the Mechanical Accounts of these Fevers we raise upon that Foundation, will be incontestably true. But to begin this difficult Undertaking.

§. XXV. IT is evident, that a greater quantity of Blood does make a Weight proportionably great to the augmented Quantity. But then, naturally, as the quantity of Blood is, so is the Strength of our Body, or its Power to resist this greater Weight, and in that Case the added Weight is insensible, otherways than in the present Supposition. But, 2dly, we become sensible of an extraordinary Weight, when besides our own Body we carry some other along with us; and after the same manner we be-

gin to find our own Body heavy, when it either becomes heavier, or retaining the same Weight, there happens a Defect either in preparing, secreting, or deriving Animal Spirits: For then *ex hypothesi*, there is the same, or a greater Weight to be supported by a less Force; and because of this Inequality of the Weight and Force of our Body it feels heavier, or we are sensible of a more than ordinary Weight. That this may happen so by a quantity of Blood that is more than natural, is very manifest. For let it be supposed that the Blood has no other Defect, besides its greater Quantity, yet because of this its Quantity, the Canals of the Blood are more distended than ordinary, and by the like Distention of the Arteries in the Brain, its whole Composition is proportionably compress'd, and by consequence, the Cavities of the tender Nerves much straiten'd; by which the Spirits are hardly derived into these Canals. Now the Strength of Muscles being, *ceteris paribus*, as the quantity of Spirits and their

their Motion, and the quantity of Spirits and Motion being less by the Difficulty of their being deriv'd into the Nerves, so is the Force of Muscles likewise, and they too being weaker, and the Weight of our Body greater, or the same, we become sensible of its Weight: Moreover, it is known that the quantity of Blood cannot be increased, above a limited Quantity, except its Cohesion is likewise greater, or that some degree of Lensor is induced into the Blood: Now because of this Lensor, the Motion of the Blood and other Liquors is much impeded, and a smaller quantity of Spirits secreted; and therefore the Weight of the Body is greater and its Strength less, and we more sensible of its Weight. Besides, it is known, that our daily Heaviness is on some such account as I have here suggested: For by the natural Lensor of all Blood and Secretions, the Velocity of our Blood does lessen to a certain Degree, and without any great Regard had to the Secretions, the Velocity of our Spi-

rits lessens $\frac{1}{2000000}$ part in a Second, and therefore an equal Respect being had to the Lensor supposed in the present Case, this Lensor and Quantity may be increased to any assignable Degree, and with it the extraordinary Weight.

Great
Feebleness.

§. XXVI. IT is from this very quantity of Blood thus augmented, and tainted with a Lensor, as well as from the Spirits being separated in a less Quantity, and derived by less Force, that this *Feebleness* does arise; for this Weakness being opposed to the ordinary Vigour with which we move, and our Bodies are carry'd from one Place to another, which being only performed by the more powerful Actions of our Muscles, and proceeding too from the quantity of liquid Blood, and that of the Spirits, these Quantities being less than natural, as well as less powerfully impelled, the Force of the Muscles and the Vigour and Agility that attend it must be proportionably less; and we must become feeble.

§. XXVII.

§. XXVII. THIS Feeblefs, or Weak- And that
nefs, must be fudden, otherwise than is fudden.
that which proceeds from a Want of
Blood, commonly proceeds leifurely,
and is the Work of Time, whereas the
other is really fudden, and tho' perhaps
the Cause does not operate fuddenly,
yet the Feebleness itself is perceived to
be very great, and that felt only sud-
denly. For if fix, eight, or ten Pounds
were necessary to compleat that Fulness
which is required to produce this and
the mentioned Symptoms, it is certain
fuch a Quantity may be readily obtained
in a little time, and consequently its
Effects will likewise appear in a little
time, or this Weakness will be fudden.
This is evident from what *Sanctorius*
has observed, for let the quantity of
what we eat and drink in one day not
only be eight Pounds, but fomewhat
lefs, viz. 7, 6, or 5, the quantity of
Stools in the largest Estimate does not
exceed $\frac{1}{2}$ a Pound, and the quantity of
our Water two Pounds, the Remainder
is

is wasted insensibly, that an Equality of Weight may be preserved in an Animal, which Equality is kept up unequally. But in this Interruption of Secretions if we are supposed to retain the half of six Pounds in one Day, then it is evident that this augmented Quantity is had in little more time than three Days, and consequently such a Weakness will be produced in so small a time. Moreover, if the requisite Quantity was supposed to be made by two or three Ounces at a time, and that Quantity was equally retained and not wasted, then it is certain the Production should not be so quick and sudden, tho' this Effect of Weakness may still be so, because we do not become sensible of the Effect till it is in that Quantity sufficient to produce the Weakness this way, and therefore we become sensible of the Weakness only after the whole Quantity is accumulated, and that being by the last added Quantity, the three Ounces, or some part of it, 'tis by the Quantity added in some part of the last Day of Health

Health we are sensible of its Effect, and we feel ourselves weak : So that this Weakness seems to be the Production of one Day, or very sudden. It is easy, in both the mentioned Cases, to make a Computation of the detained Steams in different Suppositions, and it is not impossible to determine actually, or to a small and inconsiderable Error, the real Performances of Secretions in Animals respectively, or of the same Animal at different times : But I am sensible that the present Subject does not require it ; howsoever useful it might prove, if I were treating particularly of Fevers, and it is not useless, in accounting for the *Nature*, or Cure of any Disease.

§. XXVIII. THE Heat of the Body A Coldness over the Body. is proportionable to the quantity of hot Parts in the Blood, or to its Velocity *ceteris paribus*, and the quantity of these Parts are commonly as the Quantity of Blood : Now the quantity of Blood being greater, and the hot Parts affect us less, or we are not so hot as naturally,

naturally, as if they were in a smaller Quantity : It is certain, that this less Affection of Heat does proceed only from these hot Parts being confined, so that they cannot act, and there being a Lensor in the Blood at this time, it is this Lensor that thus confines them ; or it is the Lensor that occasions this universal Coldness, by locking up the hot Parts of the Blood.

Especially in
the remote
Parts

§. XXIX. BUT in any State or Condition of the Blood whatsoever, the Fluidity of the Blood is greatest as it goes out of the *Heart* into the *Aorta*, and is likewise the grossest, as it returns by the *Cava* into the *Heart*, and this its Fluidity decreasing orderly as it removes from the Heart in the remoter Arteries : Therefore the Lensor increasing in the remoter Arteries, and the Velocity in the same being likewise less, as is the Sum of the Diameters of the Ramifications of *Arteries* to their Trunks. Now the Heat of the Body being as the Velocity of the Blood and
its

its Lensor in similar Quantities, and in Parts more remote from the Heart, or in extream Parts, the Lensor is greater, and the Velocity less; and therefore in these extream Parts is the Heat likewise less. Besides, the Blood, because of the mentioned Lensor, does not flow in a natural Quantity thorough Capillary Vessels in these extream Parts, even when the quantity of Blood in the Body is greater: So the quantity of Blood in these Parts being less as well as more gross, and of a slower Motion; the Heat too in these remote Parts is less.

§. XXX. ON the other hand, the Blood convey'd into the Brain being carried in Vessels that have fewer Ramifications than the like Vessels of the same Length, and these Ramifications running out to no great Length in the Brain, before they discharge their Liquor into wide and numerous *Sinuses*, it is on that account that the Velocity of the Blood with Lensor is more preserved in its Circulation through the Brain, than in other

Except the Brain.

other Places of the same Distance from the Heart ; and the Heat of the Blood being proportionable to its Velocity, it is greater in the Brain than in any other remote Part, because the Velocity of the Blood is greatest there.

Pain, especially of the Bones, as when one is bruised.

§. XXXI. SINCE the Blood is thus augmented in Quantity and Viscidity, both by its greater Quantity and Ineptitude to Motion it must fill, in a suitable Manner, these Arteries thorough which it flows, and the *Coats* of those *Arteries*, being stretched, with this Fulness have their compounding Parts more disjoyned from one another, which disjoyning is a *Solution of Unity*, or *Pain*, tho' from this hinted Cause of Pain, it is manifest that the Bones can never occasion any Sense of Pain; yet it is as evident that the *Periosteum*, that so closely invests them, is able to produce any sort of Pain, and that because of this their Contiguity, and the Thinness of this Membrane ; yet the Affections of the one cannot be distinguished from

from the other, if both the *Bone* and its *Periosteum* could be affected in the same manner; and it is on the account of this Confusion in perceiving the same Feeling when the *Periosteum* is thus affected, we have no Difficulty to ascribe this feeling to the Bones themselves, so that when the *Periosteum* occasions any sort of Pain; we complain of a Pain in the *Bones* that are better and more universally known to those that feel Pain, than to the *Periosteum* itself. Now as by a Fall, or a Blow, there are great Contusions, the Vessels have their Sides so press'd by the Weight and Motion of the Instrument by which these Contusions are made, that the Blood circulates but very slowly in the Vessels so compress'd; nay, the *Periosteum* is frequently press'd too by the contused Muscles, and this Feeling is produced in it; tho' by the bruising it may be hurt, as well as the incumbent Muscles, and its Vessels being distended by the Liquors flowing thorough them, will produce this Feeling originally, as

in the former Case. Since then by a Fulness of the Vessels of the *Periosteum*, Pain may arise, as in more common Bruises, it is easy to conceive from whence comes the Pain we feel in Fevers; which is like that we feel after a Bruise.

The Pulse
weak.

§. XXXII. 'TIS on account of this Lentor, that the Blood is less capable to separate its fine and subtile Parts, as has been said, and there being a less Quantity of them, the Contraction of the Muscles is so much the weaker, and consequently, since the Heart is a Muscle which gives the greatest Motion to the Blood, its Contraction being weaker, the Blood will be squeezed out of the left Ventricle into the *Aorta*, and thro' the whole Series of *Arteries*, with less Velocity. Now by this quantity of Motion and of Blood, the Sides of the Arteries are distended, and therefore being in a less Quantity they are more slowly distended, or they do not strike our Finger with that Force that

is

is natural ; and the Pulse is found *weak*, or *weaker* than it ought naturally to be.

§. XXXIII. For the same reason, Rare, and that the Spirits are generated in a smaller Quantity, and are not so quickly derived into their Canals, in Muscles; consequently the Contraction of Muscles, is not so frequent. Now since the Motion of the Heart and Arteries are synchronical, *b. e.* the Contraction of the one and Distention of the other are performed at the same time, and the Contraction of the Heart is not so frequent, the Sides of the Arteries are not so frequently forc'd *outwards*, and less affect our Touch ; or the Pulse is often *rare*.

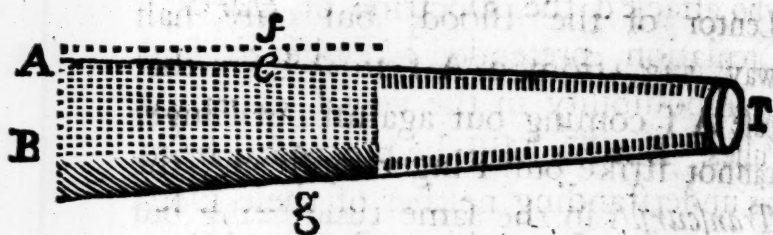
§. XXXIV. THE Pulse is made, as And de-
is hinted, by a greater Quantity of ^{press'd.}
Blood being impelled from the wider
part of an Artery into its next narrower
Section ; and that, every time the Heart
is contracted ; and in time of its Dilata-
tion, the Blood thus impelled by the
E preceed-

preceeding *Systole*, has its Motion continued by the *restitutive* Power of the Artery, *viz.* the elastical Force of its membranous Coats, and the Contraction of its muscular one. These Powers are so great, that they are able to bring the inner Surfaces of these Vessels to be contiguous, when Blood is not impelled for some time, and would always do it, but for the circulating Blood; and therefore when at any time there is a greater quantity of Blood, and that more hardly propelled because of its *Lentor*, the Arteries being fuller, are more hardly restored. Now it being by the Restitution of the immediate preceding Pulse, that the Greatness of the next doth depend, and the Restitution being less, the next Pulsation is likewise less. Yet there being a greater quantity of Blood than natural, it makes the very Feeling as if a natural Quantity did flow thorough a contracted Canal, or as if the Artery were compress'd by some incumbent Weight, and this is what they call a *depress'd* or *compress'd* Pulse.

§. XXXV.

§. XXXV. I must be a little fuller in explaining this, because a Physician, who attack'd the Doctrine of *Harvey's* Circulation, pretended likewise to find an Impossibility in the way I explain'd Pulses. But his Mistake proceeded from his understanding neither of these Doctrines, and I might well excuse my taking no manner of Notice of him then, nor now, but that I am to explain, however, this material Point of depress'd Pulses, and better than I had done before, or that I know any Physician has hitherto done. This does not altogether belong to this Place, and therefore I shall only treat in that manner, as what I have said may be illustrated in a Way that is true in general, but not sufficiently cleared till I have an opportunity to discuss it in its own Place; and therefore supposing A T to be an Artery in its natural Position, filled with Blood flowing from B, A e one side of it, and A g the other, and the prick'd Line A f the side A e, when

filled at every Contraction, and distended to *f* where the Finger is supposed to be:

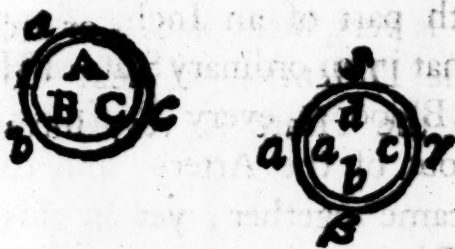


After the same manner, *A g* tending outwards as freely as *A e*, then *A g* opposite to *A e* will make an *Excursus* equal to *A e*. But when *A g* runs over a Bone, as in places where the Pulse is easiest felt, or near it, so that it cannot so freely be distended by the impelled Blood: in that case the Distention of *A g* will be added to the Distention of *A e* or thereabouts, and the Distention of *A e* will be double of what it otherwise would be. This is manifest, and is evidently the Cause of Pulses, and their being so sensible. But it has been said, that in time of the *Diastole* the side *A e* returns

turns from f to its natural Posture, and that by the mentioned Powers: Now whether Af or $2Af$ do not return to Ae because of the Resistance and Lentor of the Blood, but only half way, viz. from $2Af$ to Af ; in that case Af coming out against our Finger cannot strike our Finger so strong, the *Transcurfus* in the same time being but half the Length, and therefore the Pulse is depress'd as we have said; but if the Return is very little, viz. $\frac{1}{2}$ or $\frac{2}{3}$ of Af , then the Distention at next Contraction of the Heart is very inconsiderable.

§. XXXVI. BUT this last Consideration will more particularly appear, if we suppose ABC the transverse Section of an Artery when it is in its natural Position, but by a *Pletthora* become larger, the Artery being distended, the Section fills the Space abc . If the Breadth of the Ring be but $\frac{1}{10}$ of the Diameter of the Artery, there will be very near as much Blood contained within the Ring

as there can be in the whole Circle A B C. Now the Diameters of these Arteries, where we commonly feel the Pulse beat, are not above $\frac{1}{16}$ of Inch; and consequently the Breadth of the Ring will not be above the two hundredth part of an Inch, which is so small a Quantity as cannot be easily perceived by Sight or Touch.



§. XXXVII. SUPPOSE now the Circle a b c d to be the Section of the Artery thus distended, and because the Heart consists of very strong Muscles, the Capacity of the Heart cannot be much increased, and therefore at every Pulsation there will not be a much greater quantity of Blood discharged into the Arteries

Arteries than before the *Plethora*, it is known that the Coat $a b c d$ will be further extended at every Pulsation about an hundred part of an Inch, viz. $a \beta \gamma \delta$, so as to receive a quantity of Blood equal to what the Artery receives when it is in its natural State, or which is the same thing, the Breadth of that Ring between the two Circles $a b c d$ $a \beta \gamma \delta$, which is equal to the Circle $A B C$, will not be found to exceed the hundreth part of an Inch. Supposing then, that in an ordinary State of Health, all the Blood at every Pulsation were forced out of the Artery, and that the Coats came together; yet in this State of the *Plethora*, the Artery will not rise against your Finger above the hundredth part of an Inch, which is indiscernable.

§. XXXVIII. THIS squeezing of Blood thorough the Canal is imagined to proceed from the straitning of its Cavity, and by something that compresses it, and therefore this Pulse is said to be compress'd; but this is im-

possible tho' the feeling is just, and the quantity of Blood is too great for the Cavity of the Vessel, especially to produce a natural Pulse; nay there may be no Pulse or no sensible one according to the Fulness: But this shall be made more plain in treating of Pulses. The Words which misled this unwary Physician, who boldly opposes the Circulation, and this Doctrine, are the *tending* and *going* outwards of the Sides of an Artery every time it is dilated; for I used this manner of expressing myself when I wou'd show how its Cavity is enlarged; but he not knowing what it was for the Side to tend outwards to a Body without it self, fell into this gross Mistake of their Inside or inner Surfaces turning outward; which is as impossible as to see the Circulation on a dead Body.

With these
Sleepiness.

§. XXXIX. THE Arteries are thus distended by a quantity of Blood and Lensor, and the Pulse depress'd; but their Distention being proportionably greater,

greater, as is the Resistance the Sides of these Arteries meet with in their tending outwards is less ; it is manifest that their greatest Freedom to be distended is in the Brain, because of its Softness, which is compress'd in that manner, and to that degree almost, that the Blood-Vessels are distended ; and because of its being thus compress'd, the Secretion and Derivation of Animal Spirits is impeded by the Compression, which is still not so lasting, because of the Restitution. Yet because of this Affection we are sleepy, and therefore in time of this Quantity and Lentor, there is a *Sleepiness*, as is manifest from the Cause and Effects of Sleep.

§. XL. THUS having seen how the In a day or mentioned Symptoms are produced by ^{two.} a quantity of Blood endued with a Lentor ; it does likewise appear, how long these Symptoms are likely to continue : In general, they may be continued as long as the Lentor itself, and that according to its quantity and degrees of Cohesion,

Cohesion, it being in consideration of them that it is more easily, or hardly dissolved; more particularly, the times of its Dissolution are not altogether impossible to be determined, and we shall endeavour to do it in a Treatise of Fevers. Howsoever seeing we find, by Experience, that these Symptoms begin to go off in a Day or two, in those Years I was at Sea, or that in a Day or two the Heat did sensibly return, we may conclude that the Nature of this Lentor, was to be dissolved, in some measure in that time.

They become very warm.

§. XLI. Now the Lentor is not otherwise dissolved, and the Heat delivered of its confining viscid Parts; but by the Blood being press'd when forc'd into the Arteries, and in their Restitution so compress'd, that the hot Parts, by this Compression together with the natural Power, by which hot Parts endeavour to extricate themselves, can overcome that entangling Power of the viscid Parts of the Blood, by which they

they were detained ; and these hot Parts being thus deliver'd, will again exert their Power, and produce Heat in sensible Parts, and both by the Activity of their Parts, and that sensible Parts are warmed which contribute to the dissolving this Lentor in other Parts where it coheres more firmly, as has been said before ; since the hot and warm Parts of the Blood are delivered from their confining viscid Parts, and that because the Power of Compression is greater than the Power of Cohesion which proceeds from that Viscidity : Now since the Power of Compression is proportionable to the Velocity of the Blood, and its Velocity is greatest in these Arteries that are next the Heart ; wherefore the Power of Compression of these Arteries that are next the Heart, will be greater than in those that are more remote, *b. e.* The Heat will be felt in the Parts that are more remote from the Heart or Extremities, a great while after it is felt in the Parts that are nearer the Heart, and

and the Coldness in the remote Limbs may last after the rest of the Body has been warm, till the power of Compression in their Arteries be augmented by the continual Afflux of Blood to subdue the Force of this viscid and entangling Blood.

The Pulse is
great and
strong.

§ XLII. THE Heat thus proceeding, the Blood becomes more fluid and is more easily propelled round the Body: Now there being a greater quantity of flowing Blood, the Arteries are fuller, and their Restitution is likewise more perfect: The Greatness and Strength of the Pulse being as the quantity and Fluidity of the Blood. Moreover, by this greater quantity of more fluid Blood, there is a more plentiful Secretion of animal Spirits, and their Movement is likewise greater: But the Power of Contraction in Muscles, and the elastical Power in Fibres and Membranes that are compounded of them being proportionable to the Quantity and Momentum of Spirits, *cæteris paribus*, the
Restitution

Restitution of the Coats of the Arteries, after their violent Divulsion is greater; as also the *Impetus* of Blood flowing in these Arteries greater; and therefore the Pulse *great*, and *strong*, as before.

§. XLIII. THE Warmth at this Restless, Time being proportionable to the quantity of Blood, and the Dissolution of Lentor, and the Quantity greater as well as the Lentor being more dissolved, the Heat does likewise increase; but by the great Uneasiness Men feel from the Heat, they look after a cooler Place in their Bed, there to find some Relief from the troublesome Heat: But that too being quickly heated, they are continually moving from Place to place; which is the Symptom, which was to be explain'd.

§. XLIV. IN the present State of the Blood, the quantity of Secretions being less and the Heat greater, the secreted Liquor is soon evaporated: Now as the quantity of Spittle, which moistens

And very dry.

ens the Tongue is less, the greater is the Desire of drinking, and the quantity of Spittle being less and sooner evaporated, the Tongue must be dryer, and we have a greater Desire to drink; therefore at this time, and in this Period especially, we are very dry.

Their
Tongue
rough,

§. XLV. THE Tongue being thus depriv'd of its Moisture, the Fibres which are easily separated, from one another, must become hard. Besides, the *Papillæ*, the Instruments of our Taste, are inserted perpendicularly into it. Now both the Fibres of the Tongue, and the *Papillæ*, inserted like the Teeth of a Hackle, being deprived of their Covering, are *hard and rough*.

And black.

§. XLVI. MOREOVER, the Tongue being dry, its small Blood-Vessels cannot give way to the Blood impelled into them; and therefore, the Blood not passing out of its Vessels in the time it is impelled, the increased Quantity makes the Tongue red, and, in a little time,

time, gives Signs of Corruption, or becomes *black*. Thus it is necessary to be very particular about those minute and small *Appearances* of the *Tongue*; because by them we are plainly conducted in determining the *Nature* of the *Fever*, and in managing it thro' the time of the *Cure*: insomuch, that *many*, and *great* Practitioners have insisted on Physicians carefully considering the Condition of that little Member, and that they should never leave their Sick, without consulting it.

BUT to proceed to a brief Account of the Difficulty of Breathing that often affects the Sick on this Occasion.

§. XLVII. THE present quantity of the Blood does now take up a greater Space, it being rarified in proportion as the Lensor is dissolved, and the hot Parts are disentangled, and all these persist in Quantity, as Evacuations lessen; so that by this possessing of a greater Space, the Vessels of the Lungs

Their Breathing difficult.

are

are distended : But, because of this extraordinary Distention, the *Air-Bladders* are neither sufficiently expanded, nor freely emptied : Now the Freedom of breathing being as the quantity of Air received and expressed ; but a smaller Quantity being impelled and the *Vesiculæ* compressed by the quantity of Blood, the Respiration must needs be difficult.

And their
Breath hot
like Fire.

§. XLVIII. As there is a small quantity of *Air* impelled into the *Air-Bladders*, during the Heat subsisting, and consequently a little Quantity expired, and therefore an ordinary quantity of hot Parts transpired thorough the Lungs, and discharged among this Air, is considerably more sensible than when the same quantity of hot Parts used to be discharged among a greater quantity of the mentioned Fluid. Moreover the quantity of Air being less than is ordinary, and the quantity of hot Parts discharged being greater, as it is in the present Case ; the Heat of the
expired

expired Air is likewise greater, and swims in this Air as the hot Parts of the Sun, or of our Fires, by which our hot Feelings are produced. This Sense of Heat is the more perceptible, that it is thrown out upon the Face and Hands of By-standers, with an *Impetus* conceived from the descending Power of the *Thorax*, by which the Lungs are compress'd, and this Air expelled thorough the narrow *Aspera Arteria*.

§. XLIX. 'Tis known by Experience how our Capacities of thinking, and our Thoughts themselves are determined to particular Subjects, by the Disposition of our Body, in Youth and in Age, in the Morning and at Night; and therefore in the various Alterations that our Blood has in one Day, our Imaginations and Expressions are various: But this sudden falling from one Subject into another, or pertinaciously insisting on very trifling ones is said to be a *Delirium*; and since by the great Change that is in our Blood, that is by

They are delirious,

F the

the Commination of this Lensor the Affection is produced; 'tis no wonder how in such a time one is delirious.

And cannot sleep.

§. L. NOT only by the Force of our Fancy we are kept awake, but also by the Fluidity the Blood acquires, the Spirits being more freely separated and thrust into the Nerves, and more strongly impelled thorough their Canals; but because of this greater quantity of Spirits and their freer Derivation, the Necessity of a Recruit by Sleep is less; nay, the Cause of Sleep ceases, and therefore since this is the Case in the present Condition of a Fever, the sick Person *cannot sleep*.

Their Sickness ends by Sweating, an Hemorrhage, Looseness, &c.

§. LI. THIS Sickness evidently proceeding from a greater quantity of Blood, goes only off by the Discharge of that Quantity; and therefore it is no Wonder that sensible Evacuations are produced in the end of this Disease, or that these Discharges do put an End to it; and every one of these
and

and others not mentioned, according to the Disposition the Blood has by an assignable Power.

§. LII. BUT if the Lensor, in the first Case, is not dissolved, and remains the same, the quantity of Blood may be, and has been increased till all the Vessels of the whole Body are filled, with as much Liquor as if they had been forcibly injected with a Syringe, in which case the Blood cannot move : But, *2dly*, this Lensor will increase, so that it hinders Animal Spirits to be separated and derived, and by these the Contraction of the Heart and Motion of the Blood destroyed, and the Patient dies. *3dly*, If some Secretions continue the same, or are increased, and the Lensor not dissolved ; the quantity of fluid Blood will be lessened so much, that from the remaining thick Blood, there cannot be a sufficient Separation of Spirits to propel the Blood, the Consequence of which must be Death. On the other hand, the quantity of Blood

Or in Death.

thus augmented may be increased by the Diffolution in that manner that the Arteries of the Brain being too long kept in a Stretch, the Beginnings of the Nerves are so compress'd by them, that no Spirits can be impelled, neither any derived, or not in a sufficient Quantity for the Contraction of the Heart, which will be followed by Death.

§. LIII. T H U S having demonstrated the Necessity of these Symptoms from a supposed Interruption in Transpiration, I would proceed to Considerations of the like Nature, if I were not in the first Place obliged to vindicate this Theory from being meerly an Hypothesis, as I but lately promised. If therefore, we take one or more of the mentioned Symptoms, and read them backward according to the known and familiar Rules of Nature, without having any Regard to any Hypothesis, we shall find them proceeding from such a Fulness as has been insisted on ; and if that is true, the Supposition so far was properly

perly made, and every thing true we have deduced from it. In confirmation of this; let us take the first Symptom that offers itself to our Explication, (and every one of them will afford a proportionable Evidence) we shall find it entirely owing to this Fullness or greater quantity of Blood: For we being *suddenly weak*, it is manifest that this does proceed from the mentioned Fullness, exclusive of every thing else; and how that produces it, is evident from what is already said; and besides this way, there is not another, but by a real want of Blood and Spirits, occasioned by some *natural* Evacuation augmented, or a *preternatural* one made; but neither of these happen while we have a Fever formed, and therefore the assigned one is the Cause, as was to be proved. The admirable *Sanctorius* has taught us how this may be, by settling the Proportions of Secretions in the V, VI, XXI, LIX, and LX Aph. of the first Sect. of his statical Medicine: From these it does appear that the Discharge

by Transpiration, is not only greater than any one of the rest, but that it is the Double of all of them; nay, that in some People, it is fifteen times greater than their Evacuation made by Stool: And therefore when it is interrupted, it can produce that Fullness in half the Time, all the Secretions together can. But since they, or most of them continue to be orderly, while the mentioned Symptoms have grown into great Strength; it is therefore from an Interruption of Transpiration, that the Fullness arises, which is their productive Cause: This might be confirmed by many other ways of reasoning, as well as by various Experiences; but this is more proper to be done in an Enquiry that is more particular concerning Fevers: and all these are Confirmations of our Reasoning, and the Excellency of this plain and useful Hypothesis.

This interrupted Transpiration makes a Diarrhœa.

§. LIV. THIS Foundation being firm, I proceed to shew some other more common Consequences of Men catching

ing Cold. And first it is known, that the quantity of the Blood is not always augmented equally, in proportion to the Suppression or Interruption of Perspiration, and therefore the Matter thus detained, in an interrupted Transpiration, is discharged by other parts of Evacuation, and is the Cause as well as the Matter of these extraordinary Discharges. But supposing that any part of it is secreted in a greater Quantity by the Glands of the Intestines, Stomach, or Pancreas; the Liquor thus secreted will make every thing more liquid in the Stomach and Intestines: Besides, if it is endued with sharp Parts, it may stimulate the Guts also, and both by the Liquidness of the Excrements, and by augmenting the peristaltical Motion of the Intestines, those Excrements are protruded out by the Anus with great Force, *b. e.* the Matter of insensible Perspiration being thus discharged at the Guts, will occasion a *Diarrhœa*: For that is nothing else than a more frequent going to stool with *Slime, Gall, or other Hu-*

See the Book
of Fluxes.

mours, because of an extraordinary Contraction of the Guts, an increase of *Excrements*, their greater *Liquidity*, or of most, if not of all of them together.

§. LV. BUT since it is a matter of Fact, that this Distemper is not frequent in the Channel and other Parts where these Observations were made, and since it likewise appears, by the mentioned Book, what the productive Causes of all Loosnesses are. Now few of these Causes there described being to be found here, we cannot reasonably expect Loosnesses so frequent, as in other Places. Upon both these Accounts of their not being common, as we learn from Reason and Experience, it manifestly follows, that a more minute Enquiry into the Nature of a Disease, that affects so seldom, is beside the Purpose of this Work; and I pass it by with less regret, that sufficient Provision is made against that Distemper, by the Account given of it in the Book lately mentioned. Wherefore, avoiding to give the Reader further Trouble

Trouble in this matter, I shall relate the Loofnesses among the casual Distempers of the Channel, and cure them as such in the practical part of this Work; referring those to the Book itself, that would know more, and have more Assistance for their better managing this Disease. However; it is manifest, that there are two very different Affections of the Blood arising from an Interruption in Perspiration, or from the catching of Cold.

THERE is a third which happens in assignable Circumstances, tho' it is not essentially different from the first Case we mentioned. The Blood, and other Humours contract such a Lensor or Thickness as we have spoke of all along; yet after it has pass'd thorough the various Periods already related, it does not acquire a due Temperament and Composition, or Health does not ensue, as in the former Case; but the Disease returns and describes more such Periods to an indefinite Number of Times,

Times, and that either by a fresh Supply of new Matter, that is able to produce this Affection intirely, or by the Means only of the former Lensor not being thoroughly dissolved. Yet, in the Intervals of the forming these new Periods, Men seem to be in perfect Health, till of a suddain, they are attack'd by this new *Paroxysm*. This, by the by, is no small Confirmation of the Account already given of the sudden Weakness.

An Account
of an Ague.

§. LVI. THE Method I will take for discovering the Nature of this Distemper, is the same I used in the former, *b. e.* I shall endeavour to relate, distinctly, those *Symptoms* and *Appearances* in that very Order they affect. Next, I shall explain them in a natural and familiar way; which being duly performed, the Practice and Method of Cure may be much improved and clearly managed. First then, they feel a *Coldness* after *Dinner*, their *Lips* are *pale*, they *tremble*, their *Pulse* is *weak*, they lie insensible while sometimes their external

Its Description.

ternal Senses are found, and sometimes their external Senses are faulty, while their Mind is clear, their Body is stiff like a *Corpse*, and they have a great *Drought*; yet instead of *Death*, which one would expect by those Appearances, come *Warmth* and *Heat*; these continue some time, and end in *Sweating*: At this time the *Pulse* is strong and more *frequent*; they have a *beating* in their *Head*, a great *Drought*, and after *sweating* they are well for some time. It returns every day, every third, fourth, &c. day *inclusive*. They commonly recover thoroughly; but sometimes it ends in *Death*, and that in the *Return*.

§. LVII. IT is evident by the foregoing part of this Book, that the Thick-
 ness of the Blood, confining the hot and small Parts of it, is the true and genuine Cause of that Coldness we observe. But the Blood tending only to this Thick-
 ness, and not having arrived to the very Degree of Lensor by which it subsists in remotest Capillaries, may yet be
 3 brought

A Coldness
 after Dinner.

brought quickly into this Condition, and that only by adding a Liquid to the Blood of the same or like Grossness; for by the Quantity of this thick Liquor the Velocity of the Blood is impeded, it becomes apter to subsist, and more readily produces this Coldness. Now the Chyle is such a Substance, and therefore the Viscidity of the Chyle, join'd to the viscid Blood, is able of itself to dispose the Blood to subsist at the time any Quantity of it may be added to the Mass of Blood. Since too, in an hour and a half after eating, the Lacteals are found full of this Chyle, which is begun to be discharged into the Blood: Therefore in an hour and a half, or in two hours after Dinner this Coldness begins to be felt.

Their Lips
are pale.

§. LVIII. IN this viscid State of the Blood, it becomes more close, condensed, and takes up less Space, so that its Vessels are not so much distended. Now it is by this Distention and Fullness of the Vessels of the Lips, as also
by

by reason of their being covered with a very fine Skin, that the Redness of the Lips is caused; but when by the Closeness of the Blood the Vessels seem likewise to withdraw, and nothing is to be seen but the genuine Colour of the Membranes and Fibres that compose these Muscles, which are pale. Therefore in the time of this Lensor the Lips must be pale. Moreover, while the Blood is endued with this Degree of Thickness, it does not flow in any Quantity thorough capillary Vessels; and therefore by the small Quantity that does flow, which is also unduly rarified, the Blood-Vessels are not distended to their natural Size, and show more their own pale Colour, upon which account the Lips are likewise *pale*.

§. LIX. THIS thick and weak Blood They trem-
being unfit to supply a natural quantity^{ble}
of Spirits; nay, according to the degree
of the Lensor, the quantity of Spirits
may be very little, and not continually,
but unequally protruded into the Nerves:

Now

Now the Motion of the Spirits being alternate, and their continual Efflux proceeding only from their Abundance in the Nerves: But at present the quantity of Spirits generated being very little, this their Efflux and Derivation is not so constant, or not perfectly continual; and consequently, the Muscles into which they are derived are not so constantly contracted, their *Æquilibrium* is unequally preserved, sometimes one Muscle, sometimes another being interchangeably contracted, and this interchangeable Contraction of antagonistical Muscles being that which Physicians call trembling; it is therefore plain, that in this Defect of animal Spirits, a *trembling* must ensue.

Their Pulse
is weak.

§. LX. AFTER the same manner, the Muscle of the Heart being more weakly contracted, by this less Quantity of animal Spirits, the Blood is less vividly expelled out of the Heart, and driven with less Force thorough all the Canals: Now as the Blood is less visibly impelled

impelled into the *Aorta*, the rest of the *Arteries* are not fully distended, or, the *Pulse* is *weak*. Moreover, by this very Defect of animal Spirits, the *Arteries* are more weakly restored, after every *Diafole*, to their natural State; now as their Restitution is imperfect, so the next *Systole* of the Heart is not so great, and the *Pulse* is oppressed and *weak* on that account; besides, all this may happen by the Lensor of the Blood itself: For by it, the *Arteries* of the Brain are kept more upon the Stretch, and consequently, in their alternate Restitution, the Spirits are not forcibly propelled, which increases this weaker Contraction of the Heart, and produces a *weak Pulse*; as is shown.

§. LXI. THE *Arteries* being under an Inability to be restored, remain longer in this dilated State, and thereby all the neighbouring Vessels, contiguous to them, are compressed, and the Progress of their Liquors interrupted. But if the Nerves are of that Number, animal Spirits

They lie insensible while their, &c.

Spirits must then be derived in a very small Quantity, and the Parts, actuated by these Nerves, become inactive. Thus a *sick Person may lie insensible, while their external Senses are sound.* On the other hand ; any one of, or all, the external Senses may be defective while the Mind is clear : This will happen, if we suppose a Quantity of this thick Blood subsisting about an Artery, or *Plexus* of Arteries, which involve, or are contiguous to any Nerve, that serves for *hearing, seeing, tasting, &c.* For when these Arteries are stuffed up and filled by the continual Afflux of new Blood, their Sides tend outwards, and are more distended, and the contiguous Nerves more compress'd, till at length, by this continual stuffing, the Nerve is so much compress'd that it hinders the Motion of animal Spirits in those Canals, tho' their Sides may not be quite squeezed together ; and thereby a Man may be *thick of hearing, or perfectly deaf*, he may be *blind*, lose his *Taste, &c.* yet he may recover them suddenly, the Coldness being

being over, after the thick Blood can pass into the Veins.

§. LXII. In this State of a Lensor, Their Body
Spirits are not only generated in a small like a Corpse.
Quantity, and the Sides of the Arteries
more distended than ordinarily, as has
been said, which occasion a small Quan-
tity of Spirits to be derived into the
Nerves; but, likewise, this *thick* Blood
is next to stagnating in all its Vessels:
Yet in time of this defective quantity
of Spirits, these Spirits are equally pro-
truded into the Nerves, and the Muscles
are equally contracted; but by this equal
Contraction, the Muscles and their An-
tagonists remain in *Æquilibrio*, and, by
consequence, without Motion. Besides,
this Ineptitude to Motion is increased
by this Thickness of Blood that flows
thorough the Muscles, and therefore
the *Body* lies *stiff, cold*, extended like a
Corpse.

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§. LXIII.

They have a
Drought.

§. LXIII. THIS Symptom has already been accounted for ; but there is something very particular in the Observation itself ; for the Drought is great, without a Dryness of the Tongue ; a Symptom very common in the *slow*, and some other kinds of a, *Fever* ; a *Drought* without a *Dryness*, but not without a great *Heat* in the *Tongue*. This is a common Error in observing, which well deserves our considering.

In the place
of Death
comes
Warmth and
Heat.

§. LXIV. NOTWITHSTANDING of this fatal Expectation from the Body lying extended with *Cold*, *Trembling*, *Paleness*, and a *low Pulse*, yet the *Heart*, having no antagonistical Muscle, is contracted while the Action of the rest is suspended, or kept in *Æquilibrio*, by their equal *Contractions* ; but because the Motion of the Heart is continued, and the Endeavour of the hot Parts, to extricate themselves from this Viscidity, *Heat*, and *Fluidity*, will at last be obtained, according to the different De-

§. 50.

grees

grees of the viscid and hot Parts, as was shown before: Now if this Motion thus continued is able to dissolve, and comminute, this gross and stagnating Blood, the Body, that appeared dead, and a Corpse, will become *warm*, and hotter for some time than before, in time of Health.

§. LXV. By this Diffolution of the Lensor of the Blood, especially if the Diffolution is quicker than the Increase of Secretions, the Blood is more liquid, and takes up greater Space; but because of its Liquidity, Spirits are separated in a greater Quantity, and derived into the Heart with a greater *Impetus*: Now a greater Quantity of Spirits being derived into the Heart, and with a greater *Impetus*, the Contraction of the Heart is stronger, and the Blood is impelled into the Arteries very quickly, and by this quick Impulse of liquid Blood, of a reasonable Quantity, the Pulse grows *great and frequent*; as was formerly shown.

The Pulse stronger and more frequent.

They have
a beating in
their Head.

§. LXVI. BLOOD being thus liquid, and in a great Quantity, is more frequently impelled into the Arteries, and distends them to a greater Wideness: Now in this frequent and great Distention of the Arteries that run on the hairy Scalp, and in that part of it about the Ear, upon which we chance to lie, the tending out of their Sides, and their beating on the Pillow, on which we lie, produce this Noise of beating, we are sensible of.

A great
Drought.

§. LXVII. BUT while the Blood is more liquid and propelled with greater Velocity, yet not to such a degree as to produce a due quantity of Secretions, it is evident, that by want of the Secretion of *Spittle* the *Tongue* is *dry*. Besides; the Motion of the Blood being quicker, and its Heat greater, the Spittle which is separated in a greater Quantity is soon evaporated from off the Tongue. And from this Dryness of the Tongue arises a Thirst,

Thirst, which is greater and more intolerable, because of the Heat.

§. LXVIII. YET the Blood being once more free, and its Lensor much dissolved, after the manner already demonstrated, the *Atrition* and *Commixtion*, that produce this Heat, being greater as is the Velocity of the Blood, and the greater the Solution of Heat is, the greater the Velocity of the Blood likewise, and these will mutually increase till the Viscidity is destroy'd, and Secretions are produc'd : But the secreted Liquor that is greatest, most sensible, and by which is the greatest Discharge, is that which is made by the Pores of the Skin. Now as this Secretion is restored by the Dissolution of the Lensor, and in that Proportion that is made, yet as this is grosser than natural, or *Sweat*, it is evident, that on the Dissolution of this gross quantity of Blood, *sweating* will ensue; but by the Discharge made from the Blood, by this great Secretion, the quantity of

It ends in
Sweating.

Blood is lessened, and its Velocity is likewise less : Now the Velocity being lessened, the Heat and other Adjuncts of a *Fever* disappear, and this being by Sweating, the *Fit* is likewise ended in Sweating, as we see.

They are well for some time.

§. LXIX. THE *Heat*, and other Symptoms of *Sickness* and *Pain* being removed by *Sweating*, as is said, the sick Person is thought to be in perfect *Health*; the *Blood* being more *liquid*, and a *Quantity* of its hot Parts being evacuated, the *Velocity* of the *Blood* not so great, and Secretions going on universally ; we find ourselves *cooler*, and our *Pulse* not so quick, neither have we any of these Beatings or other Symptoms we formerly complain'd of, but really the *Blood*, to common Observation, flowing in a natural way, they think themselves in *Health*, which tho' they have only obtained so far, as the *Lentor* is dissolved, or is not disposed to be generated afresh to make more *Returns*.

§. LXX. THO' the *Paroxysm* is determined by the mention'd way, yet if that Viscidity that produced, the first, is not consumed, but returns in a certain time; or if that is consumed, and purged off, by some of the known ways of Excretion, or so comminuted that it is changed into the Nature of pure Blood; yet the Cause which produced the first Lensor, will, in a given time, produce the like again, that can last out the same time, affect with the like Symptoms, and be reduced to pure Blood like it: Now there are two ways by which the Returns of a Fit may be made. Let us suppose then, that there are two Returns every Day, and at the same Hour (the same Reasoning will hold good for others that return in the same or any assigned difference of Time) and the first is produced by a Lensor that lasts for one Day, and thereafter is either purged out of the Body, or changed into pure Blood, and the second by a sort of Lensor of the same Quantity and

It returns
every day,
every third,
fourth, &c.

Quality with that which made the first; then any of these *Lentors*, or any other that can invade at the same Hour, and take up a whole Day before it is consumed, may successively, and by degrees, be collected in the Blood-Vessels, so that it either flows thither insensibly, but constantly in the smallest Particles, or it may be bred within the same till it can produce a Sense of Cold, or other Symptoms that attend it. Now, before this Cold and its Attendants can seize us, it is necessary that this *Lentor* subsists in the *Capillary Arteries*; which cannot be, unless its Quantity is such, that it does not mix with the Blood, and flow with it freely thorough the Arteries. Therefore, either this great Quantity of *Lentor* is bred at once in the Blood-Vessels, which is possible; or else it is derived into them at once from other Parts, which is not unconceivable; but it is very evident how this very Quantity may flow into these Vessels by degrees, or be bred gradually in the same: Wherefore it is manifest, that in
the

the Space of one Day, either some Lensor, or something that may breed this Lensor, may get into the Vessels, and in so small a Quantity, that it takes up a whole Day before a sufficient Quantity is collected to produce the Coldness, and its Attendants; so that at the end of a Day, the Coldness will begin again, and will make a new Return, by this Lensor that was collected in the Space of a Day. The same thing is true of other Returns not made by the same Lensor coming again, but made by a new one, the former being quite consumed. This Consumption may be sooner or later in the same day, according to the different Nature of the Lensor, the Bodies that are mixed with it, and their Dissolution in the Increase and Declination of the Disease.

§. LXXI. IT is no Contradiction, nor Impossibility for this Lensor to be collected by degrees, and to lie in the Blood till it is sufficient to make a *Paroxysm*, tho' it must circulate thorough the

the Body several hundred of times before a *Paroxysm* can be produced; and therefore it is more apt to be wasted in the great quantity of Transpiration and other Secretions, than to lie so long as to make any Disease.

§. LXXII. I T is true, that it is hard to apprehend how so small a Quantity of Matter, as we suppose this to be, should be mix'd in with twenty Pound of Blood, and either not assimilated to its Nature, or cast out with its Parts that are plentifully discharged at that time in sundry Places: But so long as we know that it is Matter of Fact which happens in many other Cases, it is still possible in this, which is all that is alledged; yet if all the *Phænomena* can easily be followed by this Supposition, the Thing may be true. Some of these Instances are *Asparagus*, *Onions*, *Cassia*, *Rhubarb*, *Turpentine*, &c. whose *Smell*, *Colour*, and other of their sensible Qualities we know are preserved in the Blood for more Days than one, by their
being

being discharged in that time in *Urine*, *Milk*, &c. for this is a certain Argument that there is something of these Bodies carried into the *Breasts* and *Kidnies*, without losing of its Nature, tho' it has been often carried thorough the *Lungs*, and all the Body, and it may be very probable that this viscid Stuff may be very often carried round the Body without any considerable Alteration. The *biting* of a *mad Dog* is a most extraordinary Example, which shows how the whole Mass of Blood may be tainted and corrupted, by an insensible Quantity of a Liquor which produces no manifest Effect, till after many thousand Circulations, for the Space of thirty or forty Days. So that before its appearing in these Days it has circulated some thousands of Times thorough the *Lungs*, without suffering any Diminution of its Strength; nay, in that time it has alter'd the whole Mass of Blood, and changed it into its Nature: Therefore if some such thing is suppos'd of this Viscidity,
which

which is mix'd with the Blood, there can be no room left for doubting.

§. LXXIV. THO' the different ways hinted of making this Lensor might be fully made out, as the last ; yet at present we take its Original from the way the Blood is affected by an Interruption of Transpiration, tho' it may possibly be supplied from every thing that yields us *Nourishment, Passions, &c.* But let it be generated in the Blood without any foreign Substance added to it, as it may be by *Passions, &c.* Or let it be supposed, that some strange Matter was brought into it by the Chyle, from the *Viscera, &c.* All, or any of them able to form this *Lensor* : 'tis certain, its Condition being such, these *Paroxysms*, with their orderly, or disorderly Returns will follow ; for if the Chyle should be added, or any other Liquid turned into the Blood in this unnatural State : It is manifest by §. 57, that these natural Humours mixing with the Blood will

will be more or less converted into its Nature according to their respective Strength; but if it is less apt to be transform'd, the *Paroxysms* will be longer a returning; for if the Blood has still that unnatural Power, and the Humour brought into it retains its natural Power, there will be always the same Time required to change that natural Humour into that which is not natural; and this may be one, two, or three Days: On the other hand; if any one, or all of them, are of a different Nature, the Proportion of Time will be changed, and the Returns will be disorderly: But if this natural Humour is derived, at different times, from the same, or different Parts, and immediately, or in the same Distance or Interval of Time, it acquires an unnatural Power from this unnatural Blood, there may be many Returns, orderly, and disorderly, as the Derivations are orderly or confused; and if these Humours are of different Natures, consisting of Parts of different Sorts, every one of them requiring a different

different Intervals of Time before they can degenerate into this kind of Lensor, the Variety of Returns will be altogether uncertain, and keep no manner of Order. Next let us suppose, that in the *Viscera*, which are said to have considerable Secretions made in them, the viscid Liquors are returned by their Veins into the *Cava*, and in the Order of the former viscid Parts, circulate with the Blood over the Body, till they acquire such Thickness, or Quantity of Viscidity, that may make them stagnate in the small *Capillary Arteries*, and produce the *Coldness*, and other *Symptoms*; it is evident, that their Returns will happen in certain Intervals of Time, orderly and disorderly, according to the Supply that is made from these *Viscera*, or as that is mixed in a greater, or less, Quantity; *orderly*, or *confusedly*.

It ends sometimes in Death, and that in the Return.

§. LXXV. BUT if there is so great a quantity of this Lensor mixed with the Blood, that it cannot be driven out of the small Arteries into the Veins:
Or,

Or, tho' the Quantity be less, yet if its Adhesion to the Vessels be stronger than can be broken off from the Sides of these Vessels, so as it cannot be driven along in them. In that case, the Blood must stop, in a little time the Body will be cold, there will be no Blood derived into the Muscles, it either arrives not to the Brain, or totally stagnates in it, which is *Death*: But all this happening when the Coldness first begins, and that because the Lensor, that is the Cause of it, cannot be dissolved; it is therefore evident, that it is at the Return of the *Paroxysm the sick Person dies*, by not understanding this Case, and not regarding the Counsel of *Corn. Celsus*, the *Jesuit-Powder* lost its Reputation among us, and it was rather ill timed, than hurtful, when *Underwood*, Mayor of *London*, was thought to fall by it.

§. LXXVI. It is likewise evident, from what is said, that a thorough *Recovery* either *naturally* happening, or brought about by *Medicines*, is by a thorough *Dissolution* A thorough Recovery.

solution of this *Lentor*, the correcting the *Viscera* that supply it, and a total Exclusion of it, out of the Blood, whereby any Return for the future is prevented.

§. LXXVII. THUS having finished Diseases that especially happen by the Inconvenience of their Lodging, producing a Defect in Transpiration, and the Diseases that generally come from that: We proceed to other Considerations laid down in the beginning of this Book. By the by, it must be observ'd, that the different Appearances of those Diseases will be various upon the account of their moderate, or immoderate Use of strong Liquors. For if we pass a little Reflexion upon what was said concerning their Salt Victuals, Cheese, and Biscuit, it will not be difficult to defend their innocent *Saturday Evening* Cabals, where they remember their Wives, and while they keep within Bounds. The temperate Use of Liquors, more spiritous than small Beer, seems sometimes necessary to give the requisite Force to protrude

trude their gross Chyle, and to convert it into Blood, proper for Circulation in every part of the Body : So that while this clubbing of Mess-Mates keeps tolerably moderate, it may lawfully be encouraged ; for not only the general Advantage here hinted is obtained, but it is the ready way to keep them from falling into the *Dropsy*, *Jaundice*, and *Melancholia Hypochondriaca*. But to speak Truth for the honest Sailors, they seldom fail in this Point ; so long as they can exchange base Metal for generous Spirit of Wine : But are oftner very ill Husbands, exchanging all at once, and destroying the whole Purchase at a Down-fitting ; so that being got drunk, and not being able to crawl into their Hammocks, they spend the Night fast asleep upon the cold Deck, and contract those Sicknesses that attend an Interruption of Perspiration ; only their Blood being full of the Spirits of this Liquor, they do not lie so long under the Coldness that begins all Fevers, as in Fevers otherwise gotten ; for the

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small

small Parts of the Liquor sooner break and divide the viscid Parts of Blood than when it is without them; and because of the Comminution of this Lensor, the small Parts of the Blood are set at Liberty, and the Heat felt over all the Body: Therefore when the Perspiration is interrupted, and the Blood full of these Spirits, the Attrition and Comminution will be sooner perform'd, i. e. the Coldness will be sooner at an end, and so the feverish Heat begins a great deal the sooner, which, according to the Constitution and Age of the Patient, the Time of the Year, and Way of Cure, will make the Disease of less or greater Difficulty.

§. LXXVIII. THE next thing proposed, is the Consideration about the Difference that is between these Diseases thus related, and these, or others that happen in hotter Countries. It is evident by what is said, in the Preface, how much this Comparison is wanted, and how serviceable a Disco-

very

very it would prove: Nay the Relation inserted there, may convince any one that I am fully Master of that Affair. But I shall content myself with giving this Account of what was under my Observation, and leave the other Part, obtained only by Speculation, to those Physicians that have been in these Countries, or those from whom the present Counsel of the Admiralty will more graciously receive it, judging it altogether improper to serve any People against their Inclination, and therefore I shall reserve this Account to a more favourable Opportunity. In the mean time, it is certain that the *Lodging, Victualling*, and way of living being the very same in both Places, these different Effects are altogether owing to the Air in which we live, as it may concur with other Causes in producing these Diseases. We know very sufficiently the Difference of the Air there and at home, in their Heat and Weight, and only by discovering how Air of such Qualities does concur with the other

Causes, I found the Progress of their Diseases with, and without Medicines, as is said. But I am convinced that this Matter does admit of such Certainty, as *Surgeons* of an indifferent Education might be capable to practise in those Fevers, in the East and West *Indies* with as great Success, as Physicians have commonly in *England*, and other temperate Countries. Nay farther, I am sure it is not altogether impossible, to find out such Means, whereby Seamen might not be so liable to those Distempers, or a Method of preventing might be contrived, which must be of the last Consequence to any Nation that is not overstock'd with Seamen.

§. LXXIX. BUT as for those Sicknesses that are not peculiar to the Sea, but are also common to the Land, I shall consider them as interloping Diseases in the second Part of this Treatise; where I am to lay down the *Indications* for, and Method of, curing: But before I leave this Part, I shall give a short Account

count why, in this Explication, I have not used the accustomed Story of *Poison*, nor have taken to my Assistance the *Chymical Principles*, nor the Feats of *Acid* and *Alkali* in accounting for these *Appearances*; and therefore I shall proceed to the Observations themselves, which make the *second Part*.

§. LXXX. AND first, the Poison which some affirm to be in the Spirits, and which is assumed as the productive Cause of some Fevers; is a meer Supposition, unintelligible, and altogether without any Foundation in Experience. Besides; it is an unwarrantable Liberty, to fly to the Animal Spirits in solving any Symptom, without having any Regard to the Blood itself, of which they are made, and which must be always supposed in demonstrating their Nature; and truly there can be nothing found in the most malignant Fevers, that does *really* distinguish them from any other continued Fever; for the whole Difference that can be alledged,

is *ad magis & minus*, and I doubt not but that they may be naturally accounted for, by a greater or lesser quantity of this Lensor, its greater or lesser Cohesion, and its different Solution. 'Tis better, than, to give Laws to that boundless and unaccountable Poison, so much spoken of by some Authors, tho' seldom more than by the Name, without so much as its Counter-poison for a Cure, which would have been very necessary, considering how great a Difference there is between Poisons themselves. But what seems the strangest, and most surprizing, to me, is, that if in a Family of ten or a dozen People, there is one whom we should determine to have the best Blood, to be of the most athletic and robust Habit of Body, before the Invasion of this malignant Fever; yet this one shall catch it the soonest, and run the greatest Risque in his Life; or shall have it in the most malignant Manner, while the more sickly, aged, &c. shall never feel it, or if he does; he recovers without any
great

great Care or Pains. But, in short, those Fevers that are commonly accounted *malignant*, are not really different from the continued Fevers; and that they have their beginning from the same Lensor that occasions other Fevers may be evident from this; that the most of those malignant Fevers succeed these very Fevers, both *Quotidian* and *Tertian*, in which there are greater quantities of Heat, and Humidity, that dissolve this Lensor; tho' they come not so frequently after *Quartans*, in which the Viscidity is greater, and the warm Parts more confined: So a single intermitting Fever easily degenerates into two intermitting Fevers, coming in the same time that the former did; they into two continual Fevers *per subintrantiam*, and they into one which is quickly call'd malignant. And since all these Changes, are only certain Degrees of this Lensor, as 'tis more or less tenacious, and sticks to the Vessels; 'tis evident, that no more can be said, but that the last of all these Fevers succeeding in that order, or

the *formidable* malignant Fever, is of the very same Stock with the rest: And since they proceed gradually, from the smaller to the greater Degrees of this Lentor, this can only be said to have its time in a greater degree of the Lentor, as I shewed before.

Why the
Chymical
Principles.

§. LXXXI. As for the Chymical Principles; they are so far from being simple, and having the requisite Properties of Principles, as one of the most learned Chymists has demonstrated, that 'tis strange any Man should advise us to assume Propositions so unknown, in order to the explaining of Sciences, which are to end in a noble and useful Practice. The common Chymists think every empty Story about the dissolving of some Bodies, and a Jargon about the Force and Power of some Menstrua, sufficient Warrant for their explaining every Appearance in Nature; but they must commit infinite Mistakes even in this, since they are entirely ignorant of those Powers, that give *Fluidity*,

dity, *Solidity*, *Motion*, and *Rest*, to any Body, because their *Fermentations*, *Solutions*, and *Coagulations*, depend upon them, as their frequent Disappointments in their repeated Practices might convince them. The Principles offer'd to us by the Chymists, and brought off by the Force of Fire, never existed in mix'd Bodies before they were tortured with the Fire. Besides, if these supposed Principles are again mixed together, they do not constitute a like Body, as they ought to do. These Principles are so much the Offsprings of the Fire, that they are more or less *fixed* or *volatile*, according to the different *Analyses* whereby they are obtained.

BUT if we consider the Information, and Instruction, we receive from these Resolutions; we find we are left in the Dark. Would we know, by a Chymical Analysis, the *Salubrity*, or poisonous Qualities, of Plants, they cannot be distinguished: for the wholesome, and the poisonous Plants, yield the same Principles

Principles and Appearances, every whit as much as two Operations on one, and the same Plant. And therefore, as we cannot be safe, nor guarded against what is hurtful, and deadly Poison, and proper Food, our Knowledge is vain, and of no manner of Service to us.

THE *French*, in their *Memoirs* of the Year 1706, tried the different Principles that could be had from *Narbon-Honey*, and the *Honey* from *Champaigne*. Now, tho' the first of these is preferr'd to the last, for its Use and Taste; yet there was not any sensible Difference to be found by any Resolution of them into their Principles. Three Fourths of each were brought off by distilling, and one Fourth was an insipid Water; yet was acid, as the Experiments with the Juice of the Sun-flower showed. What remained was a light black Coal; which, being boiled and infused with Water, a Quantity of an Alkali Salt was obtained by the Lixive. None of them yielding any Taste of the Principal.

So

So little are we the wiser by our Skill in resolving Bodies into their Principles.

MOREOVER, if we examine the Qualities whereby their Principles act upon other Bodies, we may find their Reasoning equally precarious, and often false. For instance, Chymists speaking of their *Menstrua*, and the manner of their acting, by *corroding*, viz. It is evident, that the corrosive Quality of the *Menstruum* being the productive Cause of those Effects, then by adding somewhat else that is corrosive, it should produce them more effectually; if especially the Acidity is not destroy'd; whereas the contrary is so well known, that I should not alledge any Proof or Instance, if I were not convinc'd they will not deny what they daily see. Let us then take *Aqua Fortis*, which, they say, is able to corrode Silver, and dissolve it into the most minute Atoms by the corroding Power it has from the Vitriol and Allom, of which it is made; then,

then, by adding another thing to the Composition, that is equally sharp and corrosive, if not more, the *Menstruum* should in all reason act the more powerfully ; and therefore by adding *Sal-Armoniac*, which is a great deal more corrosive than Allom or Vitriol, it should still corrode the Silver more ; which is so far from being true, that it is not able to make the least Impression upon it, unless the Plate be extreamly thin, and red hot, and then but very little.

IF we next apply Chymical Principles to the *Theory*, or *Practice*, of *Diseases*, we shall quickly find them altogether useless, or meer Contradictions. In a *Fever*, for instance, the *Nitre* and *Sulphur* of the *Blood* the Chymists tell us, are too much exalted, and that without any Experiment ; yet we find *Nitre* and *Sulphur* mix'd together make the *Salt Prunella*, they highly commend, and is useful in the Cure of *Inflammations*, and of some kinds of a *Fever*, which is a Contradiction.

§. LXXXII,

§. LXXXII. AND lastly, to dis-<sup>Why Acid
and Alkali,</sup> credit the Principle of Acid and Alkali, it would be sufficient to observe, that they who set up for it have not let us know what it is, when they tell us, that an Acid is that which can ferment with an Alkali; and we know, that some Medicines, both simple and compounded, ferment with such as are declared Acids, and then with others that are determined to be Alkali's; and it might seem very needless to alledge their ridiculous Evasion, but that they'll mumble it over, at the reading of the Objection; and 'tis this, that that Medicine contains some Acid and some Alkali in its Parts, by which, in these two respects, it may ferment with both; and so by this Settlement they make neither Acid nor Alkali, because the Bodies are mix'd, and all mix'd Bodies partake and share of all the Principles, whatever they be, according to the Philosophers, and are said to be of this or that Nature, Acid or Alkali, which ever predominates, and bears the greatest
Share

Share in the Composition ; and if they be suppos'd equal, our noble Principles must scuffle for the Mastery. This being said in general, we may find them extremely puzzled in accounting for the Actions of their Acids in solving the most ordinary Phœnomena ; and I doubt very much if the Patrons of this Hypothesis are so certain as they suppose, that at least, when they can manifestly discover an *Acid*, viz. in a Body, the Operation of that Body upon another (which they judge to abound with an *Alkali*) must be the Effect of a Conflict between these two jarring Principles : For an acid Body may do many things not simply as an acid, but on the Score of some other Powers that Body may have. Thus when some Chymists see an acid *Menstruum*, as *Aqua fortis*, Spirit of Salt, Oil of Vitriol, &c. dissolve Iron, they presently ascribe the Effect to an Acidity of the Liquors, whereas well dephlegm'd urinous Spirits (which they hold to have a great Antipathy to Acids) will readily enough dissolve

dissolve crude Iron, and many of them even in the Cold. And even tho' this were partly allowed, we might sufficiently disprove this Hypothesis, by considering any one Disease, where we may find a vast Number of not only antecedent Causes, but other Symptoms enumerated by Medicinal Writers, that can never be accounted for, either by an *Acid* or *Alkali*. Yea, so much are its Patrons in the dark about their Principle, that we find them daily betray'd into the greatest Absurdities; for instance, its great Stickler, Dr *Blancard*, who is follow'd by all the rest, has expressly declar'd, in a whole System of Practice he compos'd according to those Principles, that all Diseases proceed from the Faultiness of the Acid only, which is the most ridiculous thing can be said in a few Words: For supposing, that *Acids* and *Alkali's* are the true Ingredients, or Components of Bodies, and that they concur as Principles in their Action, and bear Contra-parts in this Action; then, because the Influence of

either upon the other, may be augmented, diminished, or lost, and this is to be faulty or vitious; therefore 'tis evident, that either of them may have its Defects, and consequently that the Blame should not be entirely laid upon one. But in divers Cases this Hypothesis is either needless, or useless, to explain the *Phænomena* of Qualities, because there are several of these produc'd, destroy'd, or alter'd, where there does not appear any Accession, Recess, or Change of either of those two Principles, as when fluid Water, by beating, is turn'd into more consistent Froth; and when transparent, red Coral is, barely by being beaten, and finely sifted, changed into a white and opacous Powder; and lastly, when a thin Leaf of Gold appears green only by being held between the Light and the Eye.

§. LXXXIII. AND if the Maintainers of this Hypothesis pretend to constitute but two simple Principles, yet they are fain to make I know not how

how many differing Sorts of Acids, besides some Variety of Alkalis, because as there are some things wherein Acids and Alkalis agree, so there are several things wherein Salts of the same Denomination do widely differ. As some Alkalis, according to those I reason with, are fixed like Salt of Tartar, that will endure the Violence of the Fire, others like Salt of *Urine*, or of *Harts-horn*, are exceeding fugitive, and will be driven up with a scarce sensible degree of Heat: Some, as Salt of Tartar, will precipitate the Solution of Sublimate into an Orange-Tawny; others as Spirit of *Blood* and *Harts-horn*, precipitate such Solution into a milky Substance. Oil of Tartar will very faintly operate upon filings of *Copper*, which Spirit of Urine and Harts-horn will readily dissolve in the Fire. And among *Acids* themselves, the Difference is no less, if not much greater. Some of them will dissolve Bodies that others will not, as *Aqua-fortis* will dissolve *Silver* and *Mercury*, but leave *Gold* untouch'd; as *Aqua Reg.*

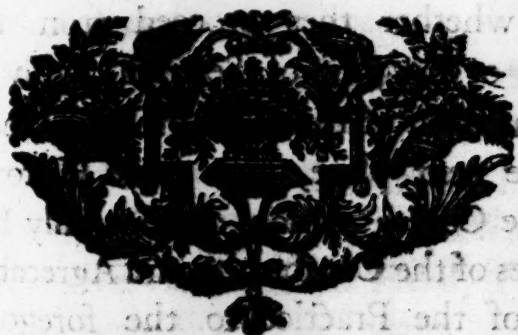
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tho' made without *Sal Armoniac*, that dissolves Gold readily, will dissolve Mercury but scurvily, and Silver not at all: And this may happen when the *Menstruum*, that will not dissolve the Body, is reputed much stronger than that which does, as dephlegm'd Spirit of Vinegar will dissolve Lead, reduc'd to minute Parts, in the Cold; which is an Effect that Chymists are not wont to expect from Spirit of Salt. Nay, which is more, one Acid will precipitate what another has dissolved, and *è contra*; as Spirit of Salt will precipitate better out of Spirit of Nitre. And I found Oil of Vitriol to precipitate Bodies of divers kinds, Minerals, and others, out of some acid *Menstrua*, particularly Spirit of Vinegar. By all which it is very certain, that *Acid* and *Alkali* are not sufficient Principles upon which an universal System can be built, since they cannot be apply'd to explain all the *Phænomena* of Nature; and there are a great many Bodies that have nothing of *Acid* or *Alkali* in their Nature, nor
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are the Result of their mixing together. Besides; every Acid does not ferment with every Alkali, and *Acids* ferment with *Acids*, and *Alkalis* with *Alkalis*. In a word, both the Insufficiency and Irregularities is found in the working of *Acids* and *Alkalis*, when they are mixed together.

The End of the First Part.





P A R T II.

Historical OBSERVATIONS of the
Sicknesses of the Fleet.

HAVING given, in the preceding Part of this Discourse, an Account of the most constant *Diseases* at *Sea*, whether they proceed from the *Diet*, or *Lodging* of Seamen, with an Explanation of their Symptoms ; I shall, in the next place, give some Histories of the Cures ; which are not only Examples of the Conformity and Agreeableness of the Practice to the foregoing Theory ; but what will enable the Surgeons to judge what is proper to be done in various other Cases, that I had not an Opportunity to relate : For a
true

true Description of a Disease being given in general, and its Symptoms, and Indications of Cure being determined, much Difficulty in administering Medicines is removed.

THE Cases, I here relate, having passed under my own Observation in the Ships where I resided, and in the Hospital Ships, I often visited, the Facts were well known by myself; otherwise than in the rest of my Squadron, which I could not so much depend upon, tho' they were under the same Orders as to their Practice.

Observation I.

ISAAC PETT was taken ill, on Observat. 1. Board his Majesty's Ship the *Elizabeth*, with a Heaviness in his Head, Pain in his Bones and Thorax, want of Appetite, and a sudden Weakness; his Pulse was depress'd, and slower by eight or ten Strokes in a Minute; about thirty hours after, his Pulse was more free and

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quick,

quick, he had a great Drought, his Tongue was very rough.

Hints for
curing Fe-
vers.

IN the Cure of Fevers, we know by Experience that those People, that are left to themselves, and take no Medicines, shake off their Fever by *Sweating*, a *Looseness*, a *Hemorrhage*, *Diabetes*, &c. which gave the first Intimation to Practitioners to provoke *Sweat*, (some with internal Medicines, others in Baths, and the *Irish* of old by laping themselves up in Blankets, thoroughly wet in cold Water) to give *Glysters*, (for farther their *Hellebore*, *Aloes*, and *Scammony* would not allow them to go) to open a *Vein* or *Artery* with Lancets; or by Cupping with Glasses or Horns (which some use to this day) to give Medicines that provoke *Urine*, &c. But even all these have been disapprov'd in part, in some one Place of the World or another, by observing, viz. In *Bleeding*, that because it is more frequently used in *France* and *Spain* than in *Italy*, they conclude, that if *Bleeding* contributed notably

notably to promote the Cure of Fevers; then, where that is practised, more would recover, than where it is neglected; and consequently, that if they did recover their Patients in *Italy* with as great Success as in *France* or *Spain*, Bleeding may be reckon'd indifferent: And in *Turkey*, where they cure their violent continual Fevers (as Physicians call them) with *Abstinence* and *Sherbett*, they condemn us for our frequent Use of *Diaphoretic* and *Sudorific* Medicines, and we return the Charge upon them, without any further Consideration. But, which is yet worse, Men are apt to give up their Reason, to such a degree, that they obstinately retain that sort of Practice, in which they were bred, wherever they come, and will stiffly and positively maintain that to be the only safe Method, and all others fatal and pernicious. But those Countries too, that are settled to one sort of Practice, so soon as by some Alteration in the Season, (perhaps to the better) and other Circumstances of Curing, they find their Way

The Reason of an unsuccessful Practice.

not to answer, and to be more uncertain (if any thing can be more so than a set Practice); then the Disease is *malignant, quite new, Mankind chang'd, &c.* which would make People believe, that whatever Certainty there may be in Medicine, yet there is little or none in the Cure of Fevers. This indeed is candidly acknowledg'd by the most skillful and learned Physicians in every Age; and tho' the Success seems to favour the Use of some principal Medicines, yet, at best, this is a casual and fallacious Proof: For some Fevers are sometimes so safe, that the sick Person recovers without any Help of the Physician, or whether he has practised well, and according to the Rules of Art, or wrong and knavishly: But besides all these Mistakes, there is still another more considerable one, of which very many are guilty; and that is, because we see, that all these different Ways of Practice are, and have been successful in different Ages and Countries; therefore we may use them promiscuously, and all at once: Where-

as, the Consequence were more just, that since Medicines of different Operations, and of different Powers, are employ'd with equal Success, Observations founded on so great Uncertainties are of little Use; and that our Industry were better bestowed in discovering those proper Circumstances in Fevers, when Methods and Medicines of one sort are like to produce better Effects than any other that are commonly used, tho' they have their Excellency too, on other Occasions. Then our Successes should be conformable to our Expectations, then should there be a Place for Prognosticks, neither should we think it sufficient, nor that we had done our Duty, when we employ any one, or number, of those Medicines Experience seems to have put into our Hands, for curing Fevers. By this it appears, that an indifferent Use of those Medicines, given in Fevers, is unreasonable, and cannot have any good Effects.

BUT

What our
Thoughts
are about the
former Inti-
mations.

BUT to return to our Subject ; if we reflect upon the Theory demonstrated in the first Part of this, 'twill be evident, that because this Disease proceeds always, with us at least, from an *Interruption of Perspiration*, and because the the Mass of Blood is corrupted and vitiated, by the quantity of the Steams thus detained, that the genuine and natural way of curing this, is by Evacuation ; either according to the Quantity of the detained Humours, or at least in such a Proportion, as may set the Parts of the Blood at greater Liberty ; and so, because the different Secretions depend upon the different Degrees of the Blood's Velocity, when the Blood acquires a Velocity like that which is natural, it will also have natural Secretions, and in this manner be reduced to its natural Contact and Cohesion, *i. e.* it will be propelled in its ordinary and natural Way, and the Patient will recover his Health ; because Health is nothing else but the most natural Circulation of the Blood.

Blood. Now since Evacuation thus perform'd answers our Designs in curing Fevers, both by lessening the Quantity and altering the Mass, it is certain, that all the Consequences drawn from the former Intimations are just, and may be put in practice upon *reasonable* Occasions. The next Question may be, which of all the mention'd ways may be most natural and convenient for a general Practice: And since *Bleeding*, *Sweating*, and *Purging*, are most commonly received among us, I shall enquire which of these we may most generally depend upon.

AND first, since both they that allow of Sweating, and they who recommend Purging for the most general Practice, affirm that Bleeding is agreeable for both their Designs, there is no Occasion left for disputing about the Necessity and Usefulness of that Operation, if the necessary Cautions be observ'd with regard to the quantity of Blood that ought to be taken away, so

What of
Bleeding,
Sweating,
and Purging.

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that

that the Controversy lies intirely betwixt Sweating and Purging, which I shall endeavour to determine with all the Impartiality imaginable, and that by enumerating the Advantages and Inconveniencies of both. And first, because the Secretions, by the Pores, is double of all the other Secretions in the rest of the Body ; 'tis plain, where this Secretion can be perform'd, that there may be a greater Quantity separated from the Blood, in a certain time, than may be by all the other Ways together in the same space of Time ; so that for that Reason it may seem the most convenient and agreeable ; yet since it must be excited by Medicines, that supply the Blood with Spirits, and consequently unlock the Spirits of the Blood, that are confin'd by its Viscidity ; if those Medicines be given to sick People, that are young, have an abundance of Blood, and that very rich, it is plain, their Operation must be such in this Blood, that its Velocity will be much increased, and Secretions will not be made ; so the

Fever

Fever will be driven on to great Excesses, as we see but too often in our daily Practice ; and therefore this Practice can only agree with those that can have the Cohesion of their Blood altered, as well as some of its Quantity evacuated ; which is very necessary to be known, before this Practice is so generally recommended. It is not necessary for me to give my Opinion about the other two Ways of provoking Sweat, since they are not in use with us ; yet I think it will not be far from the Purpose, to remember you of an Account Dr *Willis* gives us, in his Book of Fevers, of a young Woman that lay ill, and was his Patient, and for whom he had prescrib'd a great many Medicines, that might put an end to her Fever by Sweating, but all to no purpose ; and at last, I think, he gave her two Drachms of the Spirit of Harts-horn, but nothing like Sweating appear'd : On the contrary, her Pulse was *higher*, she was very *hot* and *delirious* ; and among the rest of her idle Talk, being, doubtless, incited by an extraordinary

extraordinary Drought, she desir'd to go a swimming, and up she got for her Journey: but was kept in, till her Friends resolving to humour her, resolved to carry her to the Water: and accordingly, they not living far from the River, carry'd her down (whether with the Doctor's Consent I remember not); and when they had secured her from sinking, or going too far out of her Reach, at length threw her into the Water: and after she was brought out again, was put to Bed, where she sweat off her Fever. Some such like Cases happen very often to our Sailors, who, in the time they are delirous, or have Calentures (this Word our Surgeons use for violent Fevers, yet it is only a general Word in *Spain* for a Fever) when lying in their Hammocks in a calm Summer's Day, they see the Sea thro' the Gun-Ports very plain and smooth, and imagining it to be a green Meadow, get up a walking, and fall into the Sea, if they are not stopp'd in their way; but if they get at last into their Hammocks, they

they sweat very plentifully, and shake off their Fever. I do take notice of these Instances, with this Purpose, that we may be set a thinking of what Case of a continual Fever it may be, when this way of provoking Sweat proves so beneficial, and this being known, we may procure Sweating this way, or imitate this Operation of Nature by other like Means that are then more convenient; for besides improving our selves by great Numbers of such Examples, we at last raise the Theory and Practice of Fevers to great Certainty, and to the best Advantage.

UPON the other hand, if purging Medicines can evacuate as much out of the Blood, as the Moles that's detain'd amounts to, without heightening, or not considerably, the Motion of the Blood; then that will be a more certain Practice, and no less reasonable than the other. Now, it has been supposed that, in Fevers, the Quantity of Blood, more than what is natural, may
be

be six, eight, or ten Pounds. And since it is agreeable with our daily Observation, that we can give Medicines that evacuate, by Stool, a greater Quantity without heating the Body, or that, in a little time, any assignable Quantity may be discharged that way, therefore it is very evident, that the administering of Medicines that evacuate by Stool, will be a more certain and safe Way of curing Fevers. But whatever may be said on this Subject, I admire how that Practice can be thought agreeable at Sea, where there is so piercing and sharp an Air for, at least, eight Months of the Year! that their Operation must generally be eluded by this very Coldness. But, before we proceed to the mentioned Case of the sick Person, it is necessary to consider another Administration for the Cure of a Fever, and that so much depended on in the most desperate Cases, that Physicians have commonly their last Recourse to it. This is nothing else than applying Blistering Plaisters, which
very

very often produce notable good Effects, when the only visible one of this Application is a collected Quantity of watery Humours between the Skin and Scarf-skin, whereby the Fever is much moderated, or has a finishing Crisis in a day or two, and often sooner.

I HAVE already enquired particularly into the Operation of a Blister, when it cures a Fever; by considering the Consequence of having a Quantity of watery Humour thus discharged out of the Blood, as also what may happen by the Pain, and Particles of *Cantharides* that get into the Blood while this Water is oozing out of the Vessels. From all which it did appear, that none of these contribute much in producing this stupendious good Effect, we commonly find is brought about by applying a Blister, and that this Advantage is only obtain'd by the Wounds the Particles of *Cantharides* make in Branches of the eight Pair of Nerves that run into the Heart. Then these Corolla-

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ries

ries were deduced: 1. That the Operation of a Blister is great and sudden. 2. That the wounding of this Nerve, or a Branch of it, is so absolutely necessary for curing a *Delirium* and a *Fever*, that whatsoever Mischief the applying of vast Numbers of Blisters over all the Body may do, yet the main End is neglected, if you forget a large one high on the Nape of the Neck. 3. That if there is no Vetication after the laying on a strong Plaister, it necessarily signifies a new and prodigious Hardness in the Skin and Vessels, and a Thickning of the Blood for a further total Stop.

THIS one Discourse does sufficiently answer all the Experiences about blistering in this Part of the World; and if these useful Discourses (first begun by the Advice of the learned and sagacious Mr *Bridgman*, and discontinued by his lamented Death) had been kept up for that Year, I did intend to have my second Lecture concerning the Uses and Abuses of Blisters, by which it would

have appeared that Blisters have their proper Times for being used to the greatest Advantage, and that no Hurt may be produced by them. From this Discourse the Experiences of Blisters in different Countries, and on some Men, among ourselves, would have been fully accounted for. It might have been made appear, why this Success is not always equally sudden; why the learned *Baglivi* found them prejudicial in *Rome*, and some other People, in other Countries, have found the same; and yet, how rarely they produce such Effects here, howsoever impertinently they are often used; and so much out of purpose, that their good Success is often in danger of being call'd in question.

THE present Account answering sufficiently the Design of this Book, it is not needful that I should proceed in this Discourse, howsoever important: It is enough that the Times of Blistering are known, and that a proper Opportunity is only wanting for their being

made publick ; and therefore to make the best Use of what is already known, we go directly to the Practical Part.

O U R mentioned Patient was bled, because bleeding not only reduces this extraordinary Quantity to a Quantity that is natural, or very near it ; but also it may dismiss these Spirits that are confined by the Lensor. Wherefore he was let twelve Ounces of Blood ; then I order'd him six Grains of *Tartarus Emeticus* to be taken next Morning ; with this purpose, that there might be no Conveyance of any thing from the Stomach, that might confirm the Cohesion of the stagnating Parts, but might even break and divide those that were already in a stagnating Condition ; for which, the Reasons will appear hereafter. Having thus been let blood in one day about ten o'Clock in the Morning, and next day his Vomit working very well ; about four o'Clock in the Afternoon of that next day, his Pulse was at least ten or twelve Strokes higher than natural, and there-

therefore he took a Dose of the following Powder, to restrain that growing Motion about the Evening.

R. Occul. Canc. ppt. ʒiij. Sal. Prunel. ʒss. Crem. Tart. ʒj. m. ac divid. in IX. par. æq. Capiat unam ter in die.

ALL the while he drunk as much Barley-water, sharpen'd with Vinegar, as he pleas'd : In pursuance of this Design, and after three Days, when his Powders were done, I prescrib'd him the following Powder to be taken next Morning.

R. Pulver. Cornach. ʒss Tart. Vitriolat. Gr. v. m. ac capiat cum debito regimine.

IT purged him some eight or ten times very gently ; he slept very well that Night, and got rid of his Fever : But that he might recover his Strength the better, he eat nothing for three days but Burgoo, Water-gruel, and the like, and drank six Ounces of the *Decoctum*

Amaram Alterans every Morning for that time; all which he did with the desired Success.

Observation II.

SHELBOROW ROYDEN, in the same Ship, a Man of about thirty Years of Age, and of such a Constitution that has a Pulse of sixty Strokes, or thereabouts, in a Minute, was taken ill with a Pain in his Head, a want of Appetite, a sudden Weakness, a Costiveness, a depress'd Pulse, which grew more frequent the second Day, and then he was very hot, restless, and his Tongue dry. I order'd him to be let Blood, for the Reasons I intimated before; and because he had not gone to Stool for two or three Days, I desired he might have a Glyster in the Evening, that might purge him once or twice, and next Morning fix grains of *Tartarus Emeticus*, with which he vomited five times, and purged twice: He was very easy after his vomiting, his Pains began to go off, and his

his Pulse to beat a great deal quicker :
On the third Morning he took the first
Dose of the following Powder.

*R. Ocul. Cancr. ppt. vel pulver. testar. ovor.
non calcinat. ʒij. Sal Prunel. ʒijss. Sal
Tart. ʒss aut ʒij. M. ac divid. in IX.
part. equ. ut capiat unam ter in die.*

NEXT Morning, after the taking all
the Doses of this Powder, he was purged
with that which follows.

*R. Pulver. radic. Jalapp. ʒss Resin. Jalap.
gr. iij. Crem. Tart. ʒj. M. ac capiat hora
septima matutina.*

DURING the whole Progress of
his Sickness I allowed him the Barley
Decoction acidulated, as before : And
while he took the Powders, he had one
or two Stools a day ; and after his purg-
ing Powder the Fever was perfectly
vanquished : But, that he might recover
his Strength the sooner, I order'd him
twenty Drops of *Elixir Proprietatis* in
Barley-water for three or four Days ;

and to begin to take them a day or two after his Fever was perfectly over.

Observation III.

Observ. III. WALTER GRIFFIN, a Man of five and twenty, or six and twenty Years, and of a bilious Constitution, was taken, on the fifteenth of June last, with a *Shivering* and *Coldness*, that lasted ten Hours: his Pulse was *depress'd*, and he was troubled with *Pains* over all his Body: The same Evening, he began to be hot, his Pulse beat 90 times in a Minute, and he had an insatiable Drought; about the time his Pulse began to rise, and his Heat to increase, he had a very large Sweating, but without any Benefit.

He was let twelve Ounces of Blood that Morning; on the sixteenth he took four Grains of the vomiting Tartar, by which he vomited six or seven times, and went thrice to stool, and was a great deal easier the greatest part of that day:

On

On the 17th he began to take a Dose of the testaceous Powders I prescrib'd, or Oyfter-shells dried by lying a long time upon the Beach, and continued till he had taken nine Doses : But on the 18th his Pulse was very *high*, which beat more than a hundred in one Minute, and he inclined to be delirious. I order'd him to be let sixteen Ounces of Blood more, and to continue the Use of the Powders ; only, he took in the Evening two Grains of Camphire in that Dose, and had a very good Night : On the 19th he took his Powder without any Addition, and the following Purgative on the 20th.

℞ *Decoct. Tamarind. amar. purgant.* ℥iij.
Syr. de Rhamno ℥j. *M.*

THIS purged him twelve times very easily, and so he got rid of his Fever : I order'd him all the time of his Sickness to drink as much of the following Decoction as he pleas'd ; and he drank at least three Quarts in some days.

℞ *Radic.*

℞ *Radic. Gramin.* ℥ij. *bord. mund.* M. j.
Coq. l. a. in S. q. aq. font. ad ℥ij. sub
finem addendo passul. Maj. integr. ℥ij.
Colatur. claræ affund. acet. acerrimi q. s.
ad gratam aciditatem pro potu communi.

Now, tho' by this Method our Patients are speedily recovered, and are never, or very little delirious; yet all the Winter, and in the beginning of the Spring, (as I observ'd in visiting the Fleet at *Black-stakes*) the Coldness lasts four or five Days, tho' not such a Coldness as we feel in Agues; and therefore there must be a great deal more Circumspection used in Bleeding, sometimes in less, and sometimes, tho' not so frequently, in a greater Quantity; but this must be done with respect to the Patient's Constitution, and in the mentioned Circumstances, that the Powers of the Faculties be not lessen'd; at this time too, 'tis sometimes necessary to repeat the Powders and Purgatives a second time, and sometimes to take the following Powder,

Powder, when the *Pains* are more obstinate, and hard to be removed.

℞ *Ocul. Cancr.* ʒss. *Antimon. diaphoret.*
sal. Absynth. an ʒj. *M. ac divid. in 3 part.*
æq. quas consumat partitis vicibus eodem
die.

Observation IV.

WILLIAM RICHARDS, on Board *Observ. IV.*
the *Elizabeth*, being about thirty Years
of age, whose natural Pulse beats sixty
in a Minute, was taken on the fifth of
July last with a *Shivering, sudden Weak-*
ness, a want of Appetite, and pain in his
Bones; then he grew hot, restless, had
a great Drought, and could not sleep.
He was let twelve Ounces of Blood on
the sixth, by which his Pulse was sensi-
bly rais'd while he was a bleeding: He
took seven Grains of *Emetic Tartar*, and
being well ply'd with thin Water-gruel,
after his Vomit began to work, he vo-
mited five or six times, and went thrice
to stool, and was very quiet all that
day: I gave him no *Paregoric* in the
Evening,

Evening, as I do in some other Cases; because I constantly observe, that all *Opiat* Medicines heighten the Fever extremely, and make the Patient sooner delirious; and therefore he took nothing else that day: but on the eighth in the Morning he began the *testaceous* Powders, of which I order'd nine Doses to be prepar'd, and taken, as before. In the latter part of the tenth day he had a great Bleeding at the Nose, and lost about twenty Ounces that way, though we had let him Blood, and vomited him before; and he had a Stool or two every day while he took his Powders; yet with this bleeding his *Fever* went off. He continued the Barley-Decocti^on sharpen'd with Vinegar for his ordinary Drink, and took the following Purge on the fourteenth in the Morning.

℞ *Decoct. amar. purgant.* ℥iv. *Syr. de Rhamn.* ℥ij. *aq. Theriacal* ℥j. *M.*

THIS

THIS purged him five or six times very gently, and he recover'd daily. *Note*; that his Pulse was very high, and his Face of a red and fiery Colour before the Hemorrhage; which we did not very much endeavour to stop, tho' he bled a Pint.

Observation V.

ABOUT the same time, when we Observ. V. had some very sultry days, *John Wheeler*, in the same Ship, about thirty-eight Years of Age, was taken with a *Coldness*, loss of *Strength*, a want of *Appetite*, and a nauseating of his Victuals; his *Pulse* was *depress'd*, and he had a *Pain* in his Breast: About twelve or fourteen hours after came a violent Heat, which made him very *restless* and *dry*.

I ORDER'D him to be let nine Ounces of Blood on the ninth of *July*, and that Evening he took a Bolus of the
Conserve

Conserve of *Wood-Sorrel* and *Sal Prunella*; next Morning six Grains of *Tartarus Emeticus*, which began to work half an hour after he had taken it, and he drank a large Draught of thin Water-gruel after every Fit of Vomiting: He vomited six times, had two Stools, slept four hours after, and was much easier. On the 11th he begun the *testaceous Powder*, of which he had nine Doses for three Days, three to be taken every day; all that time he went to stool once a day, and piss'd a great deal: on the 14th he took nothing but the Decoction, I had order'd him for his ordinary Drink, and on the 15th he took the following Purge.

Rx *Pulv. Radic. Jalapp.* ʒss *Resin. Jalapp.*
gr. iij. *Crem. Tar.* ʒj. M.

THIS Purgative gave him eight Stools, and had done working by 12 o' Clock; after which he found himself a great deal better, his *Drought* abating, and his *Pulse* more natural. He call'd for
Victuals,

Victuals, and eat a little Water-gruel; and that Evening he lost six or seven Ounces of Blood at his Nose, and recover'd daily.

Observation VI.

I SAW one *John Wallin* on Board the *Observ. VI.* Hospital Ship, who was put on Board her that day; he seem'd to have been a Man of a very good habit of Body; but his Blood running about like Ligthning; his Pulse beat 132 in a Minute; he was very *dry* and *delirious*: he took that Night Conserve *Lujul. 3℥. Sal Prunel. ʒi.* in a Bolus with five Grains of Camphire. I ordered a large *blistering Plaster* to be laid on the Nape of his Neck, and one behind each Ear: they rose very well, and were removed next Morning, and the Parts dress'd with the *Empl. de Melil. simpl.* and so he was freed from his Delirium; he rested indifferently well that Night, and next Day took this Powder.

Rx Ocul.

*Rx Ocul. cancer. pptor. Sal. Prunel. pulver.
rad. serpentar. virginian. ana ʒiʒ M. ac
divid. in vi p. æq. Capiat unam quotidie.*

NEXT Day in the Afternoon, a Glyster was injected, which purged him thrice, and made him very easy and sensible; he drank what he would of the following Decoction, and recover'd on Board.

*Rx Radic. acetos. Scorzoner. ana ʒi. Hord.
mundat. M. j. Coq. in f. q. aq. font. ad
Hordei crepituram; sub finem addendo
Passul. Maj. integr. ʒiiii. Colaturæ, per
subsidentiam, clarificatæ adde aceti acer-
rimi q. s. ad gratam aciditatem.*

THESE, by the bye, are the fatal, but almost perpetual, Consequences of a diaphoretical Practice in Fevers; especially on young People, in a hot Season of the Year, or a warm Climate: For when they are put into a Sweat, they catch cold in the end, relapse, take new Doses of *Diascordium*, and *Venice Treacle*, which

which (especially when they are not allowed to drink liberally) dissipate and destroy the Spirits and Serum of the Blood, that it cannot be kept fluid, but by the hot Parts of those Medicines, which thicken the Blood, and keep up the Fever, which has the Appearance of a Hectick, with this Difference, that they do not live so long; for they are kept *mad*, and *delirious* all the time of their Life; whereas they who are truly so, die in their Senses.

Observation VII.

AT the same time I saw another, *Observ. VII.* who was put on Board the Hospital-Ship, on the 16th day of his *Fever*; his Pulse did not beat above thirty-seven Strokes in a Minute, he could not speak, but stared, and made Signs for Drink. That Night he had three such Plaisters, as I mentioned in the former Case, applied to his Neck, and behind his Ears. He took now and then two or three Spoonfuls of a Julep made of $\overline{3}$ vi of
L Barley

Barley Decoction, $\mathfrak{z}\mathfrak{ss}$ of a Cordial Tincture, and $\mathfrak{z}\mathfrak{j}$ of Syrup of Clove-Gilliflowers. I chose to make use of this Tincture, because Mr *Mackie* had it ready made, and he told me, that its Composition was only *Rad. Sarpentar.* with some *Cochineal*, and a due quantity of Spirit of Wine. By these Means, he recovered his Senses a little, and then proceeded to take this Powder.

Rx Ocul. Cancr. pptor. Sal Prunel. ana $\mathfrak{z}\mathfrak{j}$. pulv. rad. Sarpentar. virginian. $\mathfrak{z}\mathfrak{ss}$ M. ac droid. in vi p. æq. Cap. unam bis in die: He was better, while in the Ship; but the being order'd for *England*, our Patient in a few days was put ashore into the Sick-quarters at *Portsmouth*, to the Care of Dr *Smith*, and the most experienc'd Surgeon Mr *Hart*, whose Knowledge and Knife have saved the Lives of thousands of Seamen in that Part, and who cannot be too much esteem'd for his great Services.

MORE

MORE Histories of Cures, by this Method, might easily be produc'd; but these having been faithfully related, without Confusion, are sufficient to convince us, how far more preferable this Method is, than that which is managed by *sweating* Medicines.

THIS Practice succeeded for several Years, and indeed generally, in all Years; but in 1697 there happen'd a Fever, in many Ships, the Symptoms whereof were very violent, and which proved in their first appearing fatal in a few days. At that time, I happen'd to be a Board the *Dutchess*, on a Visit to Captain Leigh; but was detained there for ten Days by very blowing Weather. This Ship was the most sickly in all the Fleet, and had, in all the time of my Abode, above an hundred of those sick Persons, which I visited once every day, and Mr Birkby twice a day, besides that his Mates were always employ'd among this Crowd of sick People.

THE first Period of this Fever was off in the space of twelve Hours commonly, then they were furious and delirious, they had a great Pulse, and died in three days in that Number, that we commonly buried four or five in a Morning for the first three or four Days. It affected me extremely to see all our Endeavours so baffled, that tho' many did recover, yet this vast Number of dying Persons was very melancholy. It is needless to show how differently we attempted to stop this Mortality, by various Applications and Doses in the mention'd Method; especially that I contrived a certain and speedy Evacuation, by which the other sick People in this, and other, Ships, were cured in as short a time, as they commonly died in before, notwithstanding that in all the time I was a Board the *Dutchess*, we had never fewer down than an hundred. I shall relate three or four Cases of People cured this way, and then describe the Medicine itself.

Observation

Observation VIII.

JOSHUA MANNING was taken Obfer. VIII.
ill the latter end of *July*, on Board the
Dutchess, and of a *Pain* in his *Head* and
Bones, and was very *weak* of a sudden;
his *Pulse* was *depress'd*, he was *costive*,
and had no *Appetite*.

ON *Friday* the 24th, Mr *Birkby*,
who is a very expert and knowing Sur-
geon, let him twelve Ounces of Blood;
next Morning he took five Grains of
Tartarus Emeticus, which vomited him
four times, and made him go twice to
stool. That Evening he took ʒss of
Syrup of white Poppies; and on *Sunday*
the 26th, the Medicine, which made
him sweat from eight in the Morning,
till six in the Evening, with so good
Success, that next day, about noon, he
sat up in his Cabin, and in a day or
two he was able to walk the Deck.

Observation IX.

Observ. IX. MR Noble, first Lieutenant of the said Ship, afterwards Captain Noble, was taken ill after the same manner; and Mr Birkby, after he had let him Blood, and given him a Vomit, and the Syrup *de Mecon.* in the above-mention'd Order, he gave him next Morning the Medicine; which had so great Success, that in the Afternoon he found himself so well, that he thought he might put on his Cloaths, and go upon Deck: which he did, but catching cold, he relaps'd: I happen'd to be there the day after his Relapse, and finding him incline to be delirious, I caus'd a Blister to be apply'd on the Nape of his Neck that Evening, and next Day order'd him to take the Medicine a second time, which he did much to his Advantage, and being more careful for a day or two, he recovered very well.

Observation

Observation X.

THOMAS MUNDEN, a Kinshipman Observat. X.
of Sir John Munden's, who then commanded the *London*, was taken ill on *Tuesday*, *July 28* at Night, of a *Sickness* in his *Stomach*, an exquisite *Pain* in his *Head*, his *Bones*, and all his *Joints*; his *Pulse* was a great deal lower than his natural *Pulse*, and he had no desire to eat.

ON *Wednesday* he was let Blood; next day had a *Vomit*, and the third, the *Medicine*; which produced a very good *Effect*, to the *Satisfaction* of us all. On *Saturday* he was very hungry, but I would allow him nothing but *Water-gruel*; and on *Sunday* he took *Physick*, and recovered very fast every day.

AT the same time one of Mr *Chapman's* Mates was ill, was treated after the same way, and recovered as soon, tho' not quite so well, being a little

warmer by the Heat of the Cock-pit where he lay; so mischievous is the least extraordinary Warmth in Fevers, tho' it has not hitherto been so well look'd into, but rather encourag'd.

THESE are a few Instances of several hundreds cured by this Method, and that so successfully, that I do not think we had any who died. Howsoever, this Success was so conspicuous, that most of the Ships in the Fleet had sweating Cabins built them. A number of Men was sweated in those Cabins every day, and turned out to their Births in the Evening, after the Sweating was over: That Evening the Cabin was washed and aired, and they that were to sweat next day, had their Hammocks hung by the Cabin-door, the preceding Night.

THE Medicine itself was the most convenient I could find at that time; it was made of 3℥ Ocul. Cancror. pptor. and three Spoonfuls of the best Vinegar.

They

They were mix'd, and this Mixture was drank off before the Fermentation, that happens in mixing, was over. The Reason of all this is manifest, and the daily Success it has in the Fleet, is a constant Confirmation of the Usefulness of the Medicine.

It has its times when it may be used to the best advantage, but I always found it produced its Effects the best, with People that were delirious.

We proceed next to the Diseases that are most constant, and then to those that interlope, or that are not so common.

Observation XI.

MR Nobs, Purser to the *Elizabeth*, Observ. XI. was taken after Dinner with a *Coldness* and *Trembling*, which lasted six hours; his *Pulse* was all the while extreamly *depress'd*, and beat not above forty Strokes in a minute; then came the Warmth, which

which first begun about the Trunk of his Body, and was afterwards diffused over all. As it increased, he grew very restless, and his *Pulse* became very quick and *strong*; till at last he began to sweat, and his Heat abated proportionably as the Sweating increased. He was well for the rest of that day, and all the next; but was troubled with a Looseness: The third day he was taken ill again, and suffered over all the former Symptoms.

The general
Cure.

'T is very plain from what I said in the first Part of this Book, that the viscid and slimy *Lentor*, which first stagnates in capillary Arteries, and then in these larger Vessels, must be broken and divided, that it may be made a Substance capable of being carried round the Body without stopping, or stagnating. And because this *Lentor* has its Supply from the *primæ viæ*, the Liver, or other *Viscera*, that are known to separate Liquors, by some or all of these Liquors being viscid; we must endeavour to cut off and intercept that Supply, and to break and

render fluid the Liquors that are thus tough and viscid. Now, from which of all these this Lensor proceeds, and is supply'd, is not always very evident, tho' sometimes it may happen to be so. Let us first suppose then, that this Supply comes wholly from the *primæ viæ*; and upon this Supposition, we may conclude, that those things which empty the Stomach and Intestines of those Impurities will do the Business effectually. And because a *Vomit* performs that Work with the greatest Certainty, then a *Vomit* would be all that is requisite to compleat that Cure, and the more gentle it is, would be more for the Ease of the Patient and Satisfaction of the Physician. But I have proved before, that the other *Viscera* may discharge some of their vitiated Liquors into the Blood, which not being changed into the perfect Nature of the Blood, they stagnate in the capillary Arteries in that Quantity and Way, that are fit to produce the foregoing *Phænomena*. And they being in such Circumstances, as make them fit

fit to affect the Blood, it is evident that those faulty and virious Humours must be broken and divided, that they may be fitted to circulate with the Blood without stagnating; and that the Blood, which is thus affected, must be reduced to a State of greater Fluidity. If they had their Viscidity from the *primæ viæ* that Work could be done very easily; but it is certain that the Blood may be infinitely chang'd, without any Fault in these first Passages; and the *Viscera*, that are now affected, must have their Juices alter'd, or else they will still be in a Condition to give a continual Supply, supposing the Blood to be otherwise in a good Condition. Now the only way that Liquors, which stagnate in their Channels, can be propell'd and made fluid, is by some Power that may compress, break, and divide the Liquors thus stagnating; and because this breaking and dividing must be perform'd by somewhat, that contracts or violently compresses the obstructed Parts, and breaks the stagnating Juices; and
this

this can only be perform'd by the Contraction of the Muscles, and their compressing the *Viscera*, that are near them; therefore the moderate Exercise of those Muscles will be very proper. But in our natural or voluntary Contractions, they have not that Violence, that is necessary to make a sufficient Compression fit to break and divide this extraordinary Lensor. And since there are a great many Muscles, that are obstructed, and could have sufficiently broken the stagnating Liquors in the neighbouring *Viscera*, that cannot be moved and contracted by the Power of our *Will*; some Way must be contriv'd to make such a violent Contraction of those Muscles, especially, that are able to compress the neighbouring *Viscera*; and if we examine all the Consequences that attend the giving of any Medicine, we shall find none that exercises more Muscles, and that with greater Violence than *Vomiting*; for not only the Muscles of the *Thorax*, and *Abdomen* are contracted with a prodigious Force, and are
able

able by their Contraction to compress the *Lungs*, *Stomach*, *Liver*, *Spleen*, or any thing that may be contained in them, and in all their Capacity, but even the whole Muscles of the Body are affected; and therefore 'tis *Vomiting* only that can produce the required Effect. Thus have we demonstrated the Way of cutting off the Supply of this Lector, that is made by the *prima viæ* and the *Viscera*, that are said to contain Liquors; so that if there were not such a Season of the Year, in which the Viscidity of the Blood is much promoted and augmented, the Blood extremely weaken'd and dispirited with repeated Paroxysms, or otherwise, this Disease might be conquer'd by these very Means. But when the Air is foggy, moist, cold, and the Blood weak, we must have respect to that, if we will cure our Patient; and such things must be given, that may make the Blood richer, and maintain its Fluidity.

WE have an infinite Number of Medicines, that are said to produce such Effects; but the long, tedious, and unsuccessful Practice of former Ages convinces us of the contrary. We heard indeed a great deal of specific Medicines of opposite Powers; but never saw any thing, that deserv'd that Name before the *Indian Bark*. We had diaphoretical and warming Medicines, that broke and divided the Blood, and made it more fluid for some time, but were so far from being able to keep it so, that on the contrary, they destroy the native Spirits and Serum of the Blood, rendering it more apt to stagnate and to be obstructed. The *Indian Bark* then, or *Jesuits Powder*, being by daily Experience that Specific we desir'd, we ought not to neglect it, tho' it was not found in a *Matras*. But not to insist upon Experience in a thing, where we have so many reasonable Proofs, tho' *that*, of itself, is a sufficient Proof: For we see how the sinking and languishing Pulse

is

is rais'd by the taking of it, and that without any burning and extraordinary Warmth; *i. e.* we find it has such a Power as is able to introduce a freer Motion, which cannot be done but by freeing the confin'd Spirits, that they may be separated in due time and proper place. And since this setting the Spirits at liberty can only be performed by breaking the viscid Blood, and this *Attrition* is the thing required; therefore the Jesuits Powder, *Quinquina*, &c. answers our Desire, and gives us what we require. Now, tho' it is plain that the Jesuits Powder produces this Effect, it is not the Jesuits Powder, as such, or its Name alone, that is able to charm and lull asleep this intermitting Fever; but since we see plainly that it can do so, we should give it in a sufficient Quantity to produce that Effect; and when we give it, to be sure it may be carried into the Blood. For if this be not done, it is quite as good, if not better, to keep it in the Paper and look upon it, and from that to expect your Cure,

Cure, than to take it into a Foul Stomach, full of thick Impurities, there to be clogg'd up in impure Matter, and perhaps to be carried out of the Body with the Excrements, or else to be carried in this Condition into the Mass of Blood to the Misfortune of the Patient : Or, if either of these happen, given in the time of a *Looseness*, to be immediately carry'd off by Stool, and never reaching the Blood, it does not communicate its *Efficacy* and *Virtue*.

'Tis not easy to assign the Nature of those Parts of *Jesuits Powder*, which produce those Effects, neither is their Size, Solidity, Quantity of their Motion, easily determined; this is never to be done, and yet by considering the nature of an *Intermitting Fever*, we may very well know its Operation by this its Effect: Nay, this Knowledge of its way of working, by its Effects, may sufficiently answer our whole Design of Curing, as much as if we had discover'd the mentioned Size and Position of

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Parts,

Parts, that seem to be requisite for our more perfect Knowledge. If we enquire, then, into the Nature of the Bark, by its Effects in curing an Intermitting Fever, we must conclude, that its Particles have that Solidity and Quantity of Motion, which is necessary to dissolve the Lensor we know produces that Disease. Besides, by looking more narrowly into the Means of this Dissolution, we may be capable to find the properest Methods of dissolving the Lensor of Blood.

THO' this Discovery about the Operation of the Bark may appear to be very general, and of little use: Yet from it we may be taught, why the Bark should fail of Success either in time of a Looseness, or when we sweat very much, or perhaps by any considerable Evacuation that happens while we take it. From this account it likewise follows, that if the Bark has this Power of dissolving Lensor, and making the Blood more fluid, than in Cases where the
Blood

Blood happens to be so, or is soon brought into it, the Bark is not to be us'd. It follows likewise, what Power of dissolving the Bark may have, in respect of other Medicines employ'd for the like Purposes: For, by their Effects of dissolving their Strength does appear. Let it be suppos'd that the Force of other Medicines used upon such Accounts was able to put off the Fit of an Ague for three Hours, and we know no Medicine that can do it for so long a time; yet we know that the *Jesuits Powder* keeps off a Fit for six Weeks commonly; and therefore the Force of the one Sort must be to the Force of *Jesuits Powder*, in producing the like Effect, as three Hours and six Weeks; or, as one, and three hundred thirty six.

THERE is no need of any Defence of this way of reasoning, among People who know that the most certain Knowledge we arrive at is somewhat this way, and with so good Success, that

Machines are made, Ships of Burthen are contrived, and all other mechanical Things that appear stupendious are raised up on such like Comparisons, howsoever simple their Principles seem to be: But if great and useful Consequences do follow out of such easy and obvious Principles, it ought rather to confirm their Likeness to Nature, which is their great Perfection, and can never be any just Ground of Disparagement and Reflexion.

THE other Means, employ'd in this Discovery, are indeed more pompous, but nothing so true: For we get no great Length in the Enquiry, when manifest Experience destroys the Allegation of such Principles. The Chymists first produce their Fire and *Mens-trua* to our Assistance, and pretend to show us that useful Principle in the Bark, by which its great Effects are produced, nay, and to concenter too the sanative Particles for our greater Service: But after all their Enquiry, they
tell

tell us that they are the resinous Parts of this Medicine that are thus healing ; which, if true, is no more than the first Question : For we understand just as much, when they tell us of its Vertue being in its Rosin, as if they had told us, that it is in the Bark. We know, indeed, that its Tincture, made with any spirituous Liquor, is the strongest, and that because 'tis the Property of Rosins to be best dissolv'd in Spirits ; 'tis plain that this Bark contains a great deal of Rosin, which is all that can be concluded from this Experiment. But to proceed ; let us suppose, that all the Vertue is extracted in this Rosin, which cannot be pretended (because of a like Experiment of its yielding its sanative Power in common Water) yet we shall still be as much puzzled about the Way of this Rosin's working, as the working of the Bark in Powder, before it was a Rosin : And if they think they have answered the Question, by telling us that it produces these Effects, as it is a Rosin ; then all other Rosins will

do the same ; and therefore, they may trust to the Root of Jalap, or any other they are obliged to by their Principles, and we shall have an Opportunity to observe the Conclusion.

THE other way, that has been taken to account for the Vertue of the Bark, is by imagining it to be *astringent*; a Power quite destructive of the Requisites we have clearly laid down for curing an Ague; and no less repugnant to common Observation, as I shall demonstrate. What has been the Foundation of this Assertion, I could no where find out so clearly, as in a Discourse written by one of the Members of the Royal Society, I think, in the Year 1678; where, confuting the Power of the Bark in curing Agues, he says, that if the Patient be troubled with a *Looseness* while he is taking the Jesuits Powder, it can have no Success; therefore, says he, the Bark has its Power in a contrary way, and is *astringent*; then he subsumes for his own Purpose, that,

I

because

because it is very *astringent*, it must be very hurtful in a Disease that must be cured by Evacuation. To pass by, at this time, our Author's neglecting to prove that this Disease must be cured by Evacuation, which I very much doubt, for the Reasons intimated before ; I have said enough already to evince the Weakness of his Observation. 'Tis strange, that one should expect, that any kind of Medicine, which produces not its Effect in a Minute, but requires some Hours, at least, to affect the Blood ; should exert its Vertue, when it never comes thither ; and this being the Case of the Jesuits Powder in a *Looseness*, we may easily conclude, that the *Quinquina* will not cure an Ague in that case, whether it be *astringent* or not : by the bye, since I have occasion to examine this Argument against the Bark's Power of curing Agues, I cannot forbear taking notice of another very good Argument this Author brings for the poisonous Qualities of the Bark, and that is an Experiment from its hindering the Fer-

mentation of Yeast and Wort ; that, because if a due Quantity of the Jesuits Powder be cast into Wort, before the Yeast is added, the Wort never ferments, and therefore this Powder is poisonous. I confess, I know not how to answer an Argument which I do not comprehend ; but if every thing that hinders the Fermentation of Yeast and Wort be poisonous, what must become of us poor Mortals in the poisonous Times either of a frosty or of a very hot Season, for the Brewers find their Ale and Beer ferment but very ill in such Seasons : And besides, *Sugar, Spirits of Harts-horn, &c.* poured into Wort, in a due Quantity, hinders its Fermentation ; yet they were never reckoned among the Number of Poisons : But, on the contrary, if I thought the Hypothesis of *Acid* and *Alkali* tolerable, I should like the Bark the better for the Experiment this Author has help'd me to : For in that way, the Blood in an Ague is viscid, by the Power of the coagulating *Acid*, which
can

can only be destroy'd by a powerful *Alkali*, such as this Experiment proves the Bark to be.

At other times, the *Peruvian Bark* is charged as an *astringent* Medicine, and is said to produce this its Effect on that account. An Observation of sick People being costive, while they take it, is made the Foundation of this Opinion, but since *Vomits*, *Diaphoretics*, *Diuretics*, and many other *Medicines*, as certainly make Men costive as *Astringents*, there is no better Reason for calling it an astringent Medicine than a vomiting one. On the other hand ; if it cures *Agues* as an astringent Medicine, then as strong, or more powerful, *Astringents* would have the same Effect ; which is contrary to an Experience, or Observation that can be alledg'd to the contrary ; we know 'tis used every day with the best Success in *Hysteric Fits*, and the *Suppression* of *Womens Monthly Courses*, where no body ever advis'd so powerful an astringing Medicine

dicine, as they would have the Bark to be.

'T is true, we have seen some ill Symptoms appearing after the giving the Powder; but the Question is, whether these Symptoms are the *Disease's*, the *Bark's*, or the *Physician's*; and this I shall endeavour to resolve, by following out *Helvetius*, a Physician in *France*, who had at that time writ a Book, he dedicates to the *French King*, and allows a great many of them to be owing to the Powder being given by the *Mouth*, and contrives a new way of giving it, and that by *Glysters*. I shall first then enquire, how far his Allowance is good, and to be follow'd, and what is to be thought of his new Practice; which, I think, will be very obliging. But before I do this, it will be necessary to shew, that I have not forgot my Observation; and therefore, when I have related one or two more, I shall come to those Reflexions.

AND

AND first, because Mr Nobs was troubled with a *Looseness*; and that it might not hinder the Operation of the Vomit, I intended to give him, for the preceding Reasons, the Night before, I prescrib'd him the following Bolus to be taken going to Bed.

℞ *Conserv. Ros. Rub. ʒss. Sanguin. Drac. ʒj. Laudan. Opiat. gr. jss. Syr. de Mecon. parum ut f. Bolus.*

NEXT day, he being to have the Fit about two o'Clock in the Afternoon, I order'd him, upon the former Design, six Grains of *Tartarus Emeticus*, to be taken about Noon: He vomited five times, and drank not so much after every Fit of vomiting, as I allowed my Patients in Fevers; that the Compression by the Contraction of the Muscles might be the geater; he went once to stool, and about the end of the working, his Coldness began, and lasted only two Hours; then succeeded a very sharp Heat,

Heat, which went off sooner than before by *Sweating*, which was very plentiful; for I had desir'd him to bear with the hot Fit, and lie very close, that he might sweat, else I would give him no Medicine till the next Fit; which he did: Then being temperate, the Blood being now comminuted, and sufficiently fluid, I order'd him to begin the Powder I had caused to be made up into an Electuary, that it be might be convey'd into the Blood in its healthy State; as also it might comminute more easily any viscid Matter that should be convey'd to the Blood by any of its ways of Supply; and in that Quantity I thought reasonably could destroy the Viscidity of one Paroxysm, and this he took in as great Quantities, as he could easily digest before he took more.

℞ *Pulv. Chin. Chin. subtiliss. pulverat. ʒj.*
Conserv. Ros. Rub. ʒss. Syr. e Chalyb.
q. s. ut f. Electuar. Cujus capiat quantita-
tatem Nucis Myristicæ majoris, tertia
quaq;

*quaq; hora, superbibendo Vin. Hisp.
Cochl. iij.*

. IN the Dose he took before Bedtime, I order'd him one Grain of *London Laudanum*. He miss'd his Fit, and din'd at five o'Clock in the Afternoon upon a Chicken, and drank a Glass or two of red Wine at Dinner. Next Morning he began an Infusion I had ready for him to take of, till his Blood was reviv'd, and should recover its Strength, and it was this.

R Rad. Gentian. ℥℥. Scorzoner. ℥iij. Serpentar. Virginian. ℥ij. Summitat. Centaur. Min. M. ℥℥. Fl. Chamom. M. ℥℥. Cortic. Aurant. ℥℥. Winteran. ℥ij. M. ac infundant. per Biduum in Vini Xeresens. generosis ℥iv. Dein capiat Cochl. v. bis in die.

By the Use of these Medicines he recover'd his Health, without the least Suspicion of a Relapse.

Observation

Observation XII.

Observ. XII. MR —, Lieutenant of the — was taken ill after Dinner with a Coldness, which lasted an hour and a quarter; his Pulse was depressed, and beat above 50 in a Minute; for he being of a thin habit of Body, his Blood very warm, it beats about 80 in that time: He had a Pain in his Head, then came the *Heat*, which began about the Trunk of the Body, and was sensibly diffus'd over the rest; it lasted three Hours, after which he began to sweat, and ended his Fit; it recurr'd the third Day inclusively, and had his cold Fit not above half an Hour, but the hot Fit lasted some seven or eight Hours, before he began to sweat; next day I was sent for, and order'd him three Grains of *Tartarus Emeticus* to be taken an hour and half at least, before we expected the Fit: He vomited some six or seven times, and went twice to stool; I order'd him to drink largely between his Endeavours to vomit:

vomit: When the Medicine had almost done working, the Fit began to seize him, and the cold Fit lasted little more than a quarter of an hour, and as it was going off, I order'd him to take the following Powder.

℞ *Pulver. Gasconic. ʒj. Laudan. opiat. gr. ℞. M.*

AFTER he had taken it about twelve Minutes he fell asleep, and slept almost two hours; but before he was awake, he was in an excellent Sweat; so he lay still till the end of the Sweating, and thereafter begun this Electuary.

℞ *Pulver. Quinquin. subtiliss. ʒj. Conserv. Acetosel. ʒvj. Syr. e Succ. Cit. q. s. ut f. Electuar. Molle, quod capiat ad magnitudinem Avellanæ tertia quaque hora, superbibendo Vini rubri Gallaci Coch. iij. vel iv.*

By the Use of this Electuary he miss'd his Fit; and began next Morning

ing to take this Infusion, which I order'd for the strengthning his Blood.

℞ *Rad. Gentian.* ʒss. *Scorzoner. Helen.*
an ʒij. *fl. Chamom.* M. ss. *Summitat.*
Cent. min. M. j. *Baccar. Juniper.* ʒij.
Cort. Aurant. ʒss. *Tart. alb. crud.* ʒij.
præp. f. a. affund. Vin. rubelli ℥iv.
Stent per bidum in Infusion. dein capiat
colatur. claræ Cochl. iv. bis in die. Re-
petatur Infusio super eadem Medicamenta
ad alteram vicem.

HE continued the Use of these Medicines, and drank both the Infusions without any thing of a Relapse. All the time I allowed him to eat any kind of Meat that was easily digested, and to drink a Glas of Wine, or two in a day.

Observation XIII.

Obs. XIII. MR *Humble*, in the *St Michael*, to whom I was call'd, *May 1694*, at *Spit-head*, by Mr *Campbell*, who was then Surgeon to that Ship. He was first taken

taken with a *Tertian Ague*, for which he was put ashore; and after he had staid out his time, he came back with it upon him, for he was one of the Master's Mates: and so would not leave the Service; expecting his Cure Abroad, he was taking something all that time. When I was called, he had a *Quartan*, and his cold Fit used to last him some four or five hours, his *hot*, or *Fever-fit*, one hour, or an hour and a half, and then sweat: He was brought very low. I asked him when he expected the next Fit, and he told me about eight in the Morning; for it shifted forward and backward from a *Tertian*, to a *Quotidian*, from a *Quotidian* to a *Tertian*, from a *Quartan* to a *Hemitritæa*, and from that to a *Quartan* again. I order'd him to take four Grains of *Emetic Tartar* that Morning, about six of the Clock; which had just done working as his Fit began to come upon him; his cold Fit, after his Vomit, lasted two hours, his *hot* Fit two hours, and so went off by sweating. I had been

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speaking

speaking to the Surgeon about giving him the *Jesuits Powder*; but he told me, he had been so often let blood, purged, and taken so much of the Powder ashore and aboard, that he could not take more; and therefore I was resolv'd to try the Powder, my learned Colleague Dr *Morton* recommends in his Book of *Fevers*.

℞ *Pulv. fl. Chamom. ʒj. Sal. Absynth. Antimon. Diaphoret. ana ʒss. Capiat ʒss. tertia quaque hora, superbibendo Vini cujusvis generosi Coch. iij.*

HE took his Powders very orderly, till he had spent that vast Quantity, but without the departing of his eighteen Months Companion. He did no more till the next Return, but drank of the following Infusion.

℞ *Rad. Gentian. Raphan. Armorac. ana ʒss Zedoar. Serpentar. Virginian. ana ʒij. Summitat. Centaur. min. Card. Benedict. ana M. ss. fl. Chamom. M. ss. Cortic. aurant. Winteran. ana ʒij. Limatur. Mart. ʒj. Tart. alb. crud. ʒss. M. f. a.*

M. f. a. ac infund. in Vin. Hispan. generosif. ℥iij. Stent. per horas vj. in Baln. aren. ac bibat Coch. v. ter in die.

THAT Morning he expected his Fit, he took the preceding Vomit, which wrought very well, and his cold Fit lasted not above an hour, and his hot an hour and a half, and judg'd the Fit by sweating. Things succeeded so well, I desir'd he would try the *Jesuits Powder* once more, and if it had no Success, he should be at his Choice; he was perswaded, and had it made up in this Form.

℞ *Pulver. Patrum ℥i℥. Conserv. Ros. rub. ℥j. Theriac. Andromach. ℥ij. Extract. Gentian, ℥j. Sal Absynth. ℥iij. Syr. e Chal. q. s. ut f. Elect. molle; de quo capiat quantitatem Nucis Moschatæ maj. tertia quaque hora, superbib. Vin. Canarin. Coch. iv.*

AND if he escap'd this Fit, to continue with the former Tincture till he recover'd his Strength; but the next

day, after I left that Ship, I was taken with a violent continual Fever, which lasted five days, with the Practice before; and before I was fit to go abroad, our Fleet was divided, and that Ship went to the *Streights* in company of the rest, that have made *England* the Admiration of all *Europe*, under the Command of the Right Honourable the Earl of *Orford*. Some Years after, this Mr *Humble* was the first of the Master's Mates in the *London*, where I then did reside, and happening to have an Ague about the end of the Summer, he told me how he was cured by me before, and that without a Relapse, or any other Sickneſs till this time; but this was got over without any Difficulty or Trouble.

Obſervation XVI.

Obſer. XVI. CAPTAIN *Hicks*, Commander of his Majesty's Fireſhip — was taken ill for a great while of a Pain in his Heel, in the Evening, ſo that ſometimes he was ſo lame in the Morning, that

that he could hardly walk till nine or ten of the Clock.

IN my first Visit, I found he had a great many Symptoms that happen to People in *Agues*, and for that reason I was the apter to think it one; since I have seen twice before such strange personating of *Agues*, particularly in a Lady of Quality, for whom Sir *Thomas Millington* and I were concern'd: She had an *Ague* personatd by the most violent *Hysterick* Fits, that ever were describ'd by any Author, but I forbear relating that Case, because it happened not at Sea. Yet whoever understands perfectly the Theory of *Agues*, and especially about their *Return* will easily be persuaded, that there may be such Obstructions in the smaller and least compress'd Vessels that may produce such Effects, and these so supplied and discuss'd, that every way we know is necessary to end one Paroxysm and begin another; tho' I must confess, that the diligent Dr *Sydenham* is supposed to be the first Phy-

fician, who observ'd, and gave an Account of Intermitting Fevers being personated under other Diseases: But many antient Physicians had, long ago, taken notice of such Representations; tho' it was not so easy to determine them in their Practice, the Method of curing *Agues* before the Use of the *Jesuits Powder*, being tedious and uncertain, *Aretæus* of *Cappadocia*, who lived in the Reign of *Augustus Cæsar*, observes, in his Chapter of the *Cephalæa*, that *this kind of Head-ach returned by Fits, or Paroxysms, in the like manner as they who have a Fever, which is a Quotidian, and Intermitting: In some, it held them from Sun-setting till Noon of the next Day, and then intirely remitted; or else it held them from Noon till Evening, or longer, till Night.* Besides the Order of appearing, *Aretæus* has many other Examples of the Pains holding some Part of the Head more particularly, as an *Eye*, in the *Fore-head*, &c. as we find often in daily Experience. *Dr Sydenham* thought the Reason was never to be assigned.

signed. This he does in his Letter to the Learned Dr Brady, at present, King's Professor in Cambridge. "*Hic autem, says he, commemorare libet, quod sub primos hujus constitutionis annos symptoma quoddam insignis Febris intermittibus quandoque supervenerit, nempe earum paroxysmi non cum rigore & horrore, quas postea Febris excipit, invadebant; sed æger iisdem plane symptomatis tentabatur ac si Apoplexia vera laborasset, quæ tamen nihil aliud est, utcunque hunc effectum æmularetur, quam ipsa Febris caput impetens; ut ex aliis signis, ita ex colore urinæ satis liquebat; quæ intermittibus ut plurimum rubore saturato extat, qualis cernitur in urina eorum qui Ictero laborant, etsi non adeo intenso rubet, & pariter sedimentum deponit pulverem laterum fere referens. Hoc autem in casu, &c.*"

"BUT I must now take notice that a very considerable Symptom attended these intermitting Fevers, about the

“ beginning of this Constitution. Their
“ *Paroxysms* made not their Approach
“ with a shaking and shivering, and
“ then had the Fever following, but
“ the sick Person was affected in that
“ very way, as if he had been ill of a
“ true *Apoplexy*; which, nevertheless
“ was nothing else but the Fever itself
“ attacking his Head, however it
“ imitated that Disease, as was most
“ evident by a great many Signs, but
“ more particularly by the Colour of
“ of the Urine, which, in Agues, is
“ commonly of a deep Red, such as
“ that is in those that are ill of the
“ Jaundice, tho’ it be not quite so red,
“ and likewise breaks into a Sediment
“ almost like Brickduft. But in this
“ Case, &c.

THE great Dr *Sydenham* is imitated
in this by Dr *Morton*, who endeavours
to follow so exact a Guide in writing
Observations of some Diseases; but
whatever People may think of that way
of writing, I think it is the hardest
thing,

thing, to perform well, in the World, which makes the Observations of *Platerus*, *Horstius*, and a great many more Authors, who have been mightily commended, of so little real Use. I say, that Dr *Morton* does here pursue the Hint from Dr *Sydenham* at greater length, about the 82d and 83d Page of his *Pyrotologia*, and gives us the pathognomical Sign, the *Urinam bene tinctam, sedimento lateritio saturatam*, an Urine of a deep Colour, stuffed with a Sediment like Brickduft.

AND therefore, by the Conduct of Dr *Sydenham*, for I had not read the other Author when this Symptom first appeared to me, believed that my mentioned Patient had an Ague personated by their several Distempers, and this by the Gout. During the *Paroxysm*, I endeavour'd to allay the Pain, but design'd to prevent a Return by the *Jesuits Powder*, which succeeded very well given this way.

ON

ON the 8th of *May* he had a Fit in the Evening; next day, he dined by eleven in the Forenoon, and at five took this Vomit.

R Vin. emetic. ℥j. Oxym. scyllit. ℥℥. aq. theriacal. ℥ij. M. ac exhibeatur cum regimine.

THIS made him vomit six times, and gave him one Sool; and having his Fit in the Evening, he began the Powder in the Night: it was made up in an Electuary this way.

R Conf. Ros. rub. ℥j. pulv. Cbin. Cbin. ℥vj. Syr. de suc. Limon. q. s. f. electuar. molle, quod consumat ante reditum sequentis Paroxysmi.

HE took it accordingly, and prevented the Fit; he had the Tincture too, for the Design I use to give it, and suffered no Relapse.

HAVING

HAVING observed some Variety, that I was obliged to practise in curing Agues; I proceed to make those Remarks I promised, on a Book writ by Dr *Helvetius*, instructing us how to cure Fevers without taking any Medicine by the Mouth.

THE Reasons, he saith, in the 4th Page, made him look out for another way of giving the *Bark* than by the Mouth, are the Complaints some make, of an unsupportable Weight, and a violent Pain in their Stomach: Others finding their *Thorax* chang'd very much, from what it uses to be in a natural State, and such an extraordinary Heat in their Breast as if it were dried up: And lastly, because there are abundance of People, that make Resolutions every day never to take it more, tho' they have been cured in this way. Passing the known Inconveniencies of the *Quinquina*, and the general Complaint sick People make that way; be-

Places marked from this Author's Book, p. 4.

p. 5.

p. 6.

fides the particular Grievances of its disagreeable and ill Taste, because of its Bitterness, which we can never remove from this Medicine, in whatever way we give it, provided we take in at our Mouth; and 'tis still the more inconvenient, that, notwithstanding the Aversion sick People declare against it at first taking, yet we must needs renew this troublesome and nauseous Impression, by taking it a great many times a day, for six Weeks at least: Not reckoning our Necessity to begin its Use a second time upon the Occasion of a Relapse. And therefore it was, that thinking upon the Train of disagreeable Circumstances, which attend this Remedy, I have discover'd this more convenient way of giving it, whereby we may enjoy all its good Effects, and avoid all that is troublesome in it. And this way is no other than by giving it in Glysters.

THEREFORE he says, we must take an Ounce of the best *Quinquina* in Powder,

Powder, and mix it well, without any Addition, with a Quart of Milk-warm Water.

IN intermitting Fevers this Glyster must be given in the end of the *Paroxysm*, and must be repeated thrice every day, till the Patient is perfectly cured, which is not long before 'tis done ; for 'tis very extraordinary to see another Fit, very rarely two, and I, almost, never saw a third. After he is cured, we must be sure to take the like *Glysters* for twelve days more, one in the Morning, and the other in the Evening for the first six days ; and one in the Evening, only for the last six. And because it is very necessary, in this Practice, to keep the Glysters as long as is possible ; and there be some People that can keep them but a very little time, we must add, for those, half an Ounce of the Syrup of *White Poppies* to the Powder of *Quinquina*, which will mightily conduce to the keeping the Remedy without any trouble.

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p. 13.

WE must observe, that those that can keep it but a little time, must continue its Use the longer, to do that by a greater Number that cannot be done by one, and so to finish the Cure. This must not only be understood of those, that take the whole Dose, but of those too that take but a part.

p. 15.

p. 16.

THERE is not any thing among all the Symptoms attending Fevers, that can forbid the Use of this Remedy, but the Swelling of the Belly. So there is no more to be observ'd, but as there are some People that cannot keep this Glyster; so there are others that give no further Account of it, and they find themselves swoln and puffed up; and therefore it will be their best way to take a purging Glyster once in two days, which will help them to disburden it: And it is not beside the Purpose to take notice at this time, that those Glysters not having a purgative Faculty, and not being given for that end, the sick

sick People need not be disquieted or concerned, if they see not an Evacuation of *Bile*, and other Humours ; as in our ordinary Glysters.

IT is evident then, says he, that the p. 31.
sick Person shall be no more offended with its *Bitterness*, since he is to take it no more by the *Mouth* ; besides, he can find that Weight in his Stomach no longer, because the thing that produc'd that Effect is no more there.

BUT to get over the Inconvenience p. 32.
of warming the Patient, he takes a wonderful way ; “ *A l'egard*, says he,
“ *de la Chaleur, il est certain, que les*
“ *parties grossiers du Quinquina, qui en*
“ *sont la seule Cause, ne sejourant plus*
“ *dans le corps qu' autant de temps qu'*
“ *il en faut a la Chaleur naturelle pour*
“ *le digerer & en tirer ce qu' il a de vo-*
“ *latil & de salutaire, le marc qui en*
“ *reste etant rejetté aussi tot, sans etre*
“ *obligé passer par toutes les voies qu' il*
“ *parcourt quand il est pris par la bouche,*
“ le

“ *le corps ne peut que profiter de tout ce*
 “ *qu’ily a laissé d’util, ne jamais étant*
 “ *incommodé de tout ce qu’il pourroit*
 “ *avoir de pésant, d’embarrassant &*
 “ *de nuisible, qui est ce qui cause le*
 “ *Chaleur dont on se plaint tant.*

TOUCHING this *Heat*, says he, it is certain that the gross Parts of the Powder, which are its Cause, staying no longer in the Body than is necessary for the natural Heat to digest it, and to extract its Parts that are volatile, and wholesome ; and the Mash that remains, being cast out of the Body, without being obliged to pass all those ways it goes along, when taken in by the Mouth : The Body cannot but reap a vast Advantage from all the useful Parts that are left, without being, in the least, hurt by any thing of it that is heavy, embarrassing and injurious, which are the things, that make all those *Heats* they complain of. He adds, in the next Paragraph, that the People that have the Piles, are the only to whom he gives
 not

not these *Powder-Glysters*, or not in so great a Quantity, because the rough Powder, rubbing up the Vessels in the passing, is apt to provoke the Piles, or else he gives a strong Decoction of it, which does almost as well, and entirely prevents this Inconvenience.

THEN he rallies all his scatter'd Proofs he had brought for the Cure being more certain by taking the *Powder-Glysters*, than in any way it can be taken by the Mouth : For first, it is given in a greater Quantity than it can be by the Mouth ; secondly, it is always given in Substance, and so has the greater Force : And thirdly, the subtile Parts, which only act upon the Ferment of the Fever, and destroy its Ebullition, can insinuate themselves easier into the Mass of Blood by the Orifices of these Vessels, that open into the Intestines : And lastly, Experience puts this more ready and sure way of curing beyond Dispute.

O

THUS

THUS having pick'd out almost all this Author says, either to the Disadvantage of the *Quinquina* being taken in at the Mouth ; the Benefit of his own way of giving it, and the Consequences of that ; I must confess the World is oblig'd to any one that endeavours to better any Science by useful and establish'd Theories, or Intimations to perfect its Practice, by discovering such Instruments and Helps, that can make it more sure : Yet I think a Man that communicates any thing, may claim and arrogate a little too much to himself; except the Practice, or Opinion, he advances, be without Controversy, better than those that were establish'd and thought of before : And therefore, to speak my Mind freely, I think that this Trial may stand thus in very good stead, upon the Pinch of saving the Life of one, who rather chuses to die than taste this Medicine ; and of these there are very few : But I should judge that Man very rash, that would recede from the known way

way of giving the *Jesuits Powder* he has found so safe; that nothing can be more, and would go to a Practice so very doubtful, and hardly press'd with the same Difficulties brought against the taking it by the Mouth, upon any less Consideration; as we shall see immediately by the answering his Arguments, which I shall do with as great Brevity and Clearness as I can.

As to the Weight and Pain some feel in their Stomachs, after having taken the *Jesuits Powder*, it is certainly a very great Inconvenience; but I shall be judg'd by all the World, if that Swelling they feel in their Bellies be not quite as ill, and can sooner breed a *Droffy*, *Jaundice*, &c. than any Disease can be form'd by the other Method; besides, if we will be at the trouble to look back to what I have said, in the first Part of this Book, about that Symptom of an Ague, *the Weight in the Stomach*; he shall see it clearly made out, that this Weight is nothing

but a Heap of undigested and slimy Stuff that is lodg'd there, and therefore of itself is apt to make the necessary Supply, to keep up the Force of the Ague; and intercept too, any Medicines that are given in by the Mouth, for its Cure. And if he would persuade us to use his Glysters in these Circumstances, we shall never be able to cure this Ague, tho' they were supposed to have a hundred times the Force he pretends to: Whereas, if we give a Vomit to make a clear Passage, we shall feel no such Inconvenience, but especially if the Fit were well ended before we began our Medicine; and so this Complaint comes more from the Neglect of something that should have been done, than from any Defect in the *Bark*; unless, perhaps, it may add its own Quantity to this nasty Mass, and rarify that too by its subtile Parts. And so the Argument will go no further than this. *Opium*, *Steel*, *Antimony*, &c. have been given in very ill Times, and in too great Quantities, and, no doubt, there have been

been abundance kill'd so; but for all that, ought we to leave off the Use of these Medicins? No surely; and they will prove useful and noble Medicines in good Hands. But why may not our Author try, what a Decoction of the Powder, he uses for Glysters upon certain Occasions, can do towards avoiding this Inconvenience of the Powder; especially since our learned Colleague Dr *Morton* had publish'd, some two Years before this Author wrote his Book, such a Decoction for this very End; which would have prevented most Misfortunes from that Hand, when we know not this fit time to give a Vomit.

THEN for the second Inconvenience, 'tis much of the same kind; and if any one will consider the Proof I brought for the way how the *Bark* had its Effect, and the Corollaries I deduced from it, shall not be very much puzzled to find out, that 'tis only those that are of thin Habits of Body, and whose

Blood is thin, easily rarified, and inclines to be hectical, that find this *burning Heat* our Author assigns, and after they have taken the pure Powder; nay, we may fairly doubt, whether or not the Fever is truly intermitting, when we meet with the mention'd Heat: I dare appeal to himself, or any Man of Practice, if ever they found this Accident but in these Circumstances; and a wise Physician can easily provide against that, as I have endeavour'd in part, by giving the *Cortex*, as in my ninth Observation: But to see what a miserable Shift he takes to weather this Difficulty is wonderful, from what he says in the 32d Page; and if he had done any thing, he should have first told us, what the Ferment of the Fever is he talks of in the 39th Page; how the Parts, and what Parts are fittest to bring it under: And lastly, what Vessels these are that have their Mouths open into the Intestines; none of these Things he has told us any thing of, yet they were necessary to be known? Of all things in the World

World I doubt most of his Certainty in the Citation from the 32d Page; and would have thought the gross Parts of any Body the least capable to produce Heat; and to guide all this right, he tells us, that *Nature* keeps it just so long and not one half second longer, than what is necessary to separate those sanative Parts from its grosser hot Parts; this is indeed wonderful, but she that can do all this, Why did she put him to the trouble of contriving Syrup of *white Poppies*, to cause some to keep their Glysters longer, and *purging* Glysters to help others off with theirs: The rest of his Citations are about the Way of giving it, which I have nothing to do with here, tho' I thought fit to shew them, if any one be for them; and all the rest may be comprehended in this, that this Medicine is better given his way, because, as he says, the *Bark* is given in Substance, and in a greater Quantity. And first, I believe all the Physicians in *France*, at least all, or most here, give it in Substance, and have done so these

thirty Years as well as *Helvetius*; and in a way too, that our six Drachms must turn to a greater Account than his three Ounces, and allow him ten more; and this we shall make very plain, by considering that betwixt the lower end of the *Duodenum* to the end of the *Ileon*, there are infinite Numbers of Lacteal Vessels to be seen, whereby this Powder, its Tincture made in the Stomach, and other Parts, may be very easily carried into the Blood; and by which is carried of one Substance or other, at least, seven or eight Pounds in a Day, and so may be a very good way for three Drachms, $\bar{3}\text{ss}$, $\bar{3}\text{vj}$, $\bar{3}\text{j}$ of this Powder, however digested and prepared in a clean Stomach; whereas in his Way, all the Lacteals that are said to be there, are supposed upon ill made Experiments, and not one to be seen; and so, I think, our six Drachms can produce more powerful Effects than his thirteen Ounces, we have allow'd him; but suppose all the *Colon* were as full of *Milky-Vessels*, as the *Milky-Way* is

is full of *Stars*, (which we see he must not pretend to) yet I am in the Opinion he could not much better himself; for his Glysters could get no great Length; which will be very evident to any one, that will bring into his Thoughts, or lay before his Eyes the *Guts* in their natural Posture, and any one with a Glyster Syringe impelling the Liquor; I say, if he considers this, he shall have no great Difficulty to agree to my Assertion: For first, if they were supposed full, then it is evident the Resistance of the Excrements were to be accounted for; and perhaps this would do the Business: But now, we will suppose them perfectly empty, and their Sides flaccid, as we see them at that time; then, upon the one hand let us remember that the Motion they have is from the Stomach downward, and that they are tense; then next, that the *Colon*, where it joins the *straight Gut*, lies not directly with the Cavity of the straight Gut, but cuts it at oblique Angles; and upon the other hand all the Force this impell'd
Liquor

Liquor has, is only by the compressing the Sides of a *Bladder*, or a more valid Propulsion by the *Syringe*; and therefore passing the smaller Resistance from the Motion of the Guts, there is first so much Motion lost by raising the Sides of the straight Gut, whereinto it may be impell'd without any other; but so soon as it comes to the joining of the *Colon*, it must reflect at every Section of this *Gut*, and the Reflexion too, is to be made upon a *soft, tensile* Body, which is more than enough to overcome a ten times greater Force, than can be conceiv'd to be given to this Liquor by this impelling of the *Syringe*. And therefore since the *straight Gut* has no *Lacteals*, and the *Colon* were supposed to have; yet his Glysters not going any Length there, could turn to no great Account; at least, not the twentieth Part, very modestly speaking, as in the former Case.

BUT next, for the Convenience of this Practice, I think it is the most inconvenient

convenient could have been contriv'd; for who can bear fifteen Glystering Days, and to take about twenty-four Glysters in that time; and then as many in case of a Relapse: This is not only one of the most troublesome Practices, but the most expensive that can be by the *Jesuits Powder*; for supposing an *Apothecary* should let us have them at a Crown a piece, this is no less than 12*l.* for these forty-eight Glysters, besides other Medicines, which is a great deal too much for the most that grudge 4*s.* and a Crown for an Ounce of the Powder, which always cures them, with the help of such a Tincture as I have spoke of, in my Observations: And therefore by this time 'tis plain, that *Helvetius's* Practice is neither so reasonable, nor so convenient, as the giving the Powder by the Mouth; and the Misfortunes complain'd of are truly the Physician's, and not from the Bark: But we must allow him, that the Taste will not be so ungrateful, as when taken our way; tho' in so many Glysters it will be felt,

as I have found in curing of some very tender People of *Claps* by *Glysters*, which in three or four Days became almost as nauseous, as if they had taken Medicines by their Mouth ; yet at best, this is but an Inconvenience to a few, which is nothing in respect of this expensive, and unreasonable Practice: But to do Justice to Dr *Helvetius's* Method, I have found it very useful in curing *Agues* in Children, who cannot be brought to take repeated Doses of this bitter, and nauseous *Drug* ; which I gratefully acknowledge.

Observation XV.

Obfer. XV. GEORGE MANNING, aged twenty-seven Years, of a *bilous* Constitution, and a thin Habit of Body, was taken, on Board the *Elizabeth*, with an Out-breaking of abundance of red Spots upon his Legs and Arms ; a great many of those upon his Legs became of an *Olive* Colour, *yellow*, *blue*, and *black*.

IT is evident, by what I have already said concerning the Scurvy, that the great Design for curing it, must be to render the Blood so fluid that it may circulate without those Interruptions, by which it breaks some most tender and *Capillary Arteries*, and runs out in a Quantity the Resistance of the Place does allow. By those Means, the extravasated Blood will be sooner transpired, and further Extravasations be sufficiently prevented. The feverish Heats, Ulcers, and Inequality of the Pulse are no Contradictions to this Design: On the contrary, as they are Symptoms of this Disease, so they vanish likewise by this Course; tho' proper Medicines may be given, at the same time, or mix'd in with the other, whereby these Symptoms are made very tolerable while the main Design is carrying on.

THIS Disease is particularly more difficult to be cured at Sea; because their way of living, and their Food
rather

rather encourage, than contribute in the least to its Cure. Nay, notwithstanding that the *Scurvy* is reputed the most common Distemper of the Sea, I do not find any Provision made against it in the great *Inventory of Sea-Medicines*. And therefore where the Hands of a Physician are tied up for want of Tools, I cannot see what Success can be expected in that Disease. I can only inform you of what I hinted before, that of all the Number we meet with, ill of the Scurvy, a fourth Part of these do not contract it directly in declining from a State of Health ; but by beginning too soon upon their *Sea-Provisions* after they recover of Fevers, or other Distempers : So that if sufficient Care were taken about their coming upon their former Diet, they would not be so liable to have this Disease. At the same time, it is worthy our Observation how suddenly, and how perfectly they recover of this Distemper *ashoar*, when they are free of this *Diet*, and only live upon *Green-Trade*, (as they
call

call it) viz. Coleworts, Carrots, Cabbages, Turnips, &c. People put ashore, in the most pitiful State that can be imagined, are able in three or four days, by this Food only, to walk several Miles into the Country. If ever any Care is taken for the Sick in the Navy, this must be chiefly consider'd. But to return to our present sick Person; and that I may give you no further Trouble of a Sickness left without a Remedy at Sea; which is almost as melancholy as to consider these poor People at Sea, without a Rudder, I shall relate the Course I took with him in this Streight, and Difficulty.

I WAS willing to make the best I could of our Patients in *Scurvies*; and therefore, that the Medicines we have might produce the better Effect, and the Chyle, that's very often the best Alterative, might be convey'd in its full Force: I order'd him a Vomit of ʒss *Sal Vitriol.* in ʒiij of *Oxymel of Squills*, to be encouraged with large Draughts of
thin

thin Water-gruel; he vomited three times, and an abundance of nasty Stuf: Then I order'd him to take as little of his *Beef* or *Pork*, for his Meal as possible; and rather to live upon *Burgoo*, or Water-gruel; his ordinary Drink was *Barley Decoction*, to every Quart whereof I order'd ʒij of *Syr. de Altb.* to be added; and for Medicines, I prescrib'd him the following Electuary to be taken of thrice a day.

℞ *Pulp. Passul. maj.* ʒiij. *Cons. fruct.*
Cynosbat. ʒiij. *fl. Lujul.* ʒi ss oc. 69 ppt.
Æthiop. mineral. triturā ppt. ʒiij. *Syr. e*
Suc. Limon. q. s. ut f. Elect.

AFTER these Medicines were taken for three Weeks, which time he was very exact in following Directions, he recovered apace, and came to his perfect Health.

Observation XVI.

Obfer.XVI. T—— B—— was troubled with a *Looseness*, that he went to stool some fifteen times a day, for two days. On the third

third I saw him, and order'd him next Morning the following Medicines.

℞ *Rbab. el. subtil. pulv.* ℥j. *Cinam.* ℥ss.
M. ac capiat mane cum regimine.

By this Powder he did not go more frequently to Stool than he did before, and rather not so often, for he had only eight Stools by it; yet in the Evening, I prescrib'd him the following Julep.

℞ *Aq. Plantag. Laet. Alexiter. ana* ℥ij. *Cinam. bordeat.* ℥j. *Syr. Myrtil.* ℥ss. *Diasc. Fracastor.* ℥jss. *M. ac capiat Cocbl. 3 vel 4 singulis horis.*

He slept very well that Night, and had but two Stools all the 24 Hours, and thereafter continued in a natural Way, without any further Help.

'Tis true, those kinds of Medicines serve our Purpose pretty well, when the Causes of a *Diarrhæa* is confin'd to the first Passages; yet when they are produc'd in *hot* Countries, in People of a

P

thin

thin Habit of Body, and that very *hot*, &c. they are not quite so certain, but we must depend upon Medicines of greater Force, and Bleeding to the Strength of the Patient. 'Twere a Work of Supererogation to unfold the Nature, and different States of this Sicknefs, after the Way of the former, since it is not so much our constant Companion, and that afterwards I contrived a perfect Medicine, which has been found very sufficient, and, on that account, has been long practis'd in the Navy; yet, in short, I must advertise my Brethren (contrary to the most of Practice) that the most powerful Medicines given in a liquid Form, and in a great Quantity, cannot prove half so successful, as Medicines of half the Force in the contrary Circumstances.

Observation XVII.

Obs. XVI. GEORGE GARDNER was ill of a *Diarthæa* for ten Days, and in all that time he never had less than thirty
Stools

Stools every day. When I saw him, he was very weak, his Tongue was dry, and was full of *Chinks*, and was worn down to a meer Skeleton. A maigre Glyster was order'd for him, and he took the following *Bolus* after it came off.

℞ *Pulver. adversus Diarrh.* ℥ij. *Theriac.*
Androm. ʒss *Syr. fl. Cariophyllor.* q. s.
M. F. Bolus.

HE was not allow'd to drink after the *Bolus* for an hour; but then he drunk as much *Decoct. Album*, or of Water, steeping a burn'd Biscake, as much as he desir'd. He slept very well, and did not go all next day. The following Days, he went once every day, and got rid of his *Looseness*: but it was near a Fortnight before he recover'd his Flesh.

Observation XVIII.

PETER PIERCE, having return'd Obs. XVIII. from the *Streights*, was troubled with a violent Flux: He was put ashore at

Deal, and *Gosport*, but returning without any Cure, I saw him on the 9th of *June*, on Board the *Queen*, where Mr *French*, a very careful Man, is Surgeon; he went to stool some fourteen times a day, and was very uneasy in the Night, he had no Appetite for his Victuals, and was in a very weak Condition: next day he took the following Purge.

℞ *Pulv. rad. Rhabarb. ʒj. Cinam. pulverat.*

℞. *M. ac capiat cum regimine.*

HE did not go much oftner to stool than usually, and in the Evening he took the Powder I prescribe for this Disease, made into a Bolus, with Conserve of Red Roses; by which he recover'd without taking any more Remedies.

Observation XIX.

Obs. XIX. JOHN HALL at the same time came from the *Streights* with the Sickness upon him, and had the Fate of the former; he had try'd every thing that is prescrib'd

prescrib'd by Physicians in this Case, but to no purpose; at last taking the *Purgative* formerly mention'd, and then the *Bolus*; he did not go to stool for two Days, and once every day after, and recover'd his Health.

Observation XX.

AT the same time I saw *Edward Mackaffrey*, who had return'd from the *Streights* in that Ship, and was put ashore for his Illness, but to no purpose: He took this Purge on the 10th of *June*.

℞ *Pulver. radic. Jalap. cortic. Cinam. subtil. pulverat. ana ℥j. M. ac capiat cum regimine.*

HE had ten Stools that day, and in the Evening took the Powder made up with a little of the Conserve of Red Roses, and Syrup of *White Poppies* into a *Bolus*; it kept him from going to stool that night; but he having three or four stools next day, and being a little

griped, I order'd him a maigre Glyster, and in the evening the Powder made up with the same Conserve, and thereby recover'd perfectly.

Observation XXI.

Obfer. XXI. ALEXANDER FERGUSON, one about sixteen or eighteen Years of Age, return'd from the *Streights* with the rest, but went to stool about twenty times a day; he voided little but *Blood*, and a *skinny* sort of Substance, which look'd like the *Coats* of the *Guts*.

HE was let five Ounces of Blood in the Arm, that Evening for Revulsion, and next Day the following purging Powder.

℞ Rad. Rhab. elect. subtiliss. pulverat. ℥j.
Cinam. gr. xv. Ol. Caryophyllor gust. iv.
M. ac capiat cum regimine.

THIS purg'd him easily, and that Evening he took the Medicine in this Form.

℞ Pulver.

℞ *Pulver. contra Diarrhæas* ℥j. *Opobals.*
gut. viij. *Cons. ros. rub. q. s. ut f. Bolus*
bora somni sumendus.

HE slept easily, and was not disturb'd that Night; he had no Stool next day, but one the day following, and was restored to his Health.

Observation XXII.

INSTEAD of giving the History of Obs. XXII. one single Person cured of a *Diarrhæa*, or of a *Dysentery*, I shall relate the Cures of near one hundred People, all of them ill in the same Ship, the *Sandwich*, and who had the Distemper in the *Streights*, never receiving a Cure ashore, nor in the *Hospitals*. But as the Occasion was very singular, and the Witnesses Persons of the greatest Honour, I hope it will not be tedious, if I relate it under several useful Circumstances, especially as this notable Success gave a Handle for introducing my Medicine into the Navy.

OUR *Admiral*, the Right Honorable the Lord *Berkeley* of *Stratham*, Captain *Meeſe*, and I, dining aboard Captain *Beaumont*, his Lordſhip was pleas'd to expreſs himſelf very favourably about my great and uſeful Services in the Fleet. Captain *Meeſe*, Commander of the *Sandwich*, a firſt Rate, and ſoon after was an *Admiral*, ſeconded his Lordſhip's Complement; adding, there was nothing farther wanted, if I could help them, in a better Method of curing *Fluxes*. After acknowledging my Obligations for their Eſteem and good Opinion of me, I reply'd, that after ſome late Experiences, I had reaſon to think, I was able to ſerve them in that Particular; and as they were Perſons, who had the Good of the Service, and the Health of the Seamen moſt at heart, ſo my Answer gave them the greateſt Pleaſure and Satisfaction.

THE next Queſtion then was, when I would attempt the Cure of this Multitude

tude of miserable Men : The following Day was agreed upon for that Purpose, which was the 23d of July, 1696 ; when I found about Seventy, who could walk about, and upwards of Twenty that could not move out of their *Hammocks* to help themselves in any thing. There were *Robert Alvin, Edward Huggin, Charles Child, Thomas Starre, Robert Craige, &c.*

ON the 24th each of them took a Dose of *Rhubarb*, twenty Grains one with another, and ten Grains of the Powder of *Cinnamon* ; which had the desired Success, and none of them purged more than they commonly did every day. When their Purge had done working, they begun to take the Medicine against the *Flux* ; which being repeated at proper Intervals, cured them in three Days. The weakest could leave their *Hammocks* in a Week or ten Days.

THIS

THIS Recovery was so conspicuous, that I had many Patients in the other Ships of the Fleet: all which Cures were faithfully related at the Admiralty-Board by Sir *Cloudesley Shouell*, and on his Report the Medicine was entertain'd in the Navy.

Observation XXIII.

Obs.XXIII. HENRY LLOYD, having been troubled with this Distemper so long, that for a Fortnight he came not out of his Hammock, but as Men carried him in their Arms, and was so weak that he could not turn himself, had this Glyster in the Afternoon.

℞ *Decoct. commun. pro Glyster. (in quo coct. sint fl. Chamomil. Melilot. ana M. ℞. semin. Annis. contus. ℥ij. baccar. Juniper. ℥ij.) ℥viiij. Terebinth. ovi vitello solutæ ℥℞. M. f. enema quinta pomeridiana injicendum.*

HE could not keep the Glyster above half an hour, and when he voided it, there

there came along with it a great deal of *slimy* Stuff; and in the Evening he took the Medicine for the curing of *Fluxes*, as I commonly prescrib'd it: For three or four Days after, his Drink was the *Decoctum Album*, and recover'd without any Relapse. After he had been ten Days free from this Flux, and began to crawl about again, he was sent ashore to recover Strength; which he did in a very short time.

Observation XXIV.

JAMES GRAHAM, of a thin Habit of Body, fell into a most violent *Looseness*, such as Physicians commonly call a *Colliquative Diarrhœa*. He went eight or ten times to stool, every day.

Now as he had not any *Griping*, or any other Symptom, that could signify to me any thing of *Indigestion*, or of those Impurities of the Guts, that are said to, and may, maintain and produce a *Looseness*, and his Pulse being *weak*,
and

and *quick*, my Design was to lessen the Velocity by having him let Blood ; and therefore I order'd him to be let 8 Ounces, which was all I judg'd he could spare for that end, and that the Powers of the Faculties might not be lessened ; accordingly all that day he had no stool, and went very regularly thereafter ; but the *Rectum* and *Anus* being very much excoriated by the Sharpness of the Humour, which he complain'd of for three Days after, as if he felt a violent Heat in that Part ; and therefore to prevent any *Inflammations* and their Attendants, as a *Sphacelas* and *Gangrene*, I thought it most reasonable to prescribe him the following Glyster.

℞ *Aq. font. moderat. tepidæ* ℥x. *Syr. de Alth. Fernel.* ℥ij. *M. enema.*

HE kept this Glyster two hours, and then render'd it, and was very easy and well. Now, that I relate this, it brings into my Memory a pretty singular sort of a Case that happen'd last Year,

Year, when I was on Board the *Vanguard*; and because it will not want its Use, I shall presume to go back so far to relate it.

Observation XXV.

MR *Moxum*, a very brave and good Officer, then a Lieutenant in the *Vanguard*, had a Looseness for a day or two, about the time the Fleet was at *Diep*; it went off, but he was troubled with a most pressing *Tenesmus*, or a desire to go to stool. At that time I had been Aboard the *Royal William*, attending the Marquis of *Carmarthen*, since Duke of *Leeds*, who was sick of a Fever, and with whom I went into *England* to perfect that Cure; so I knew nothing of that Gentleman's Illness at home, till about eight Days after the Fleet came to *Spithead*; then I admir'd the Change was upon him, in ten Days or a Fortnight since I had seen him: He was a perfect Skeleton, he could not rest a-Nights, and his *Te-*

nesmus

nesmus continu'd : I advis'd him to go ashore for his Recovery, which he did ; but the Fleet failing six days after to the *Downs*, he follow'd the Fleet in the Ship's Pinnace, which happen'd to be ashore when the Fleet sailed, and came to us six or seven hours after we came to an Anchor in the *Downs* ; he was then worse, and complained of an *inflammatory* sort of Pain in his *Intestines*, which was very troublesome, especially as he grew warm in Bed. He told me, he could but die, and that he would do a Board, under my Care, if I would not order him Medicines a Shore ; so he went ashore with Captain *Fairborn's* Leave, and before he was four Days in *Deal*, he was a great way on his Recovery, by the Use of the following Medicines.

℞ *Decoct. fortior. Brassic. ℥ fl. Meliat. in aq. commun. ℥x. Syr. de Alb. ℥ij. Terebintb. Venet. Vitel. ovi. solut. ℥ss. Sal Prunel ℥j. M. f. enema, quod injiciatur quolibet mane hora nona, ac hora quinta pomeridiana.*

A T

AT Bed-time he took this Bolus.

R *Bals. Lucatel.* 3℔. *Nitr. corollati* ℥j.
Laudan. opiat. gr. j. *Syr. de ros. succ. q. s.*
ut f. Bolus.

HIS ordinary Drink was a small Decoction of *Sarsa* and new *Milk*, and his Diet *Bread* and *Milk*, or *Bread* and *Whey*; but after four or five days I allow'd him Chicken, and such Victuals as are easily digested; about eight Days after, he came aboard in perfect Health, and only took those Medicines for six or seven Days.

Observation XXVI.

B—— D——, Surgeon of his Maje- Obs. XXVI.
 sty's Ship the —— was taken ill of a Loss of Appetite; he could not sleep; he had a great Drought; he sweat abundantly in the Night; he was very lean, and dried up, and had great Reachings to vomit, especially in a Morning, brought up a frothy Substance only, and sometimes it was watery.

THESE

THESE Symptoms, especially the last, are commonly produced by drinking Brandy, and spirituous Liquors. When I first saw him, he was ashore in *Torbay*, and was under a Course of *Decoct. Amar.* But at my desire, he left off the Decoction, he betook himself to a Diet of Milk, and Water-gruel. Two or three times a day he took the following Electuary.

℞ *Pulp. passul. major. conf. Cynosbat. cochlear. ana ℥j. cort. Citr. condit. ℥ss. Ocul. Cancr. ppt. ℥ij. Sal Prunel. ℥iss. Syr. Alib. Fernel. q. s. ut f. Electuar. Cujus capiat magnitud. nuc. myristic. bis vel ter in die, superbibendo seri lact. recent. ac non falsi, poculum.*

HE continu'd faithfully in the Use of these Medicines for a Month, and recover'd sensibly every day.

Observation

Observation XXVII.

MR *Ankers*, Captain *Greenway's* Ob. XXVII.
Clerk in the *Edgar*, was troubled with
a Loss of Appetite for his Victuals,
a prodigious Spitting, and Apprehen-
sion of dying suddenly, Belching, a
weak and rare Pulse, and a sinking at
his Heart, with a Difficulty in fetch-
ing his Breath.

IT is evident that this Sickness which
held him for a long time, and for which
he had advised with a great many, to
no purpose, is no other than the *Melan-
cholia Hypochondriaca*, or that which
People commonly call the *Spleen*, tho'
that has not often any Share of the
Disease; and almost none of these
Symptoms I have just now named, can
be the Consequences of that Part being
any way affected, as might be easily
demonstrated by a more particular Re-
solution of the Symptoms of this Dis-
temper: But since it is no ways under

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my Consideration, at present, than as it is an *interloping* Sickness, I may suppose its Causes, in laying down its Indications for its Cure, and therefore, because the *Belchings*, *Indigestion*, and *Windiness* in the first Passages, the *Slowness* of the *Pulse*, *Unactiveness*, and *Whiteness* of the Urine, argue a Defect in the Attrition of the Chyle, and an Unfitness for its being mixed with the Blood, I order'd him a Vomit both to cleanse the first Passages, that the Chyle and Medicines might be transmitted into the Blood in their full Force, and that without weakning him ; as also that the thick and languishing Blood might receive a new Tour and Determination, by the violent Contraction of almost all the Muscles in the *time* of *vomiting*. The Vomit was five Grains of *Tartarus Emeticus*, dissolved in two or three Spoonfuls of White-Wine ; he drank now and then large Draughts of thin Water-gruel in the Intervals of the Vomiting. It wrought very easily for three Quarters of an Hour, in which

I time

time he had four Vomits, and two Stools; about an hour after it had done working, he drank a Glas of warm Sherry, and laid himself to sleep; and next Morning he took the following Potion.

R. Fol. Senn. sine stip. ℥iij. Rad. Rab. elect. incif. 3℔. infund. tepid. per noct. in decoct. fortior. passul. major. ℥viiij. Mane, colaturæ per express. factæ, adde syr. de Rhamn. 3℔. Aq. Epidemic, 3ij. fl. til. 3℔. M. ac bibat cum regimine.

THIS purg'd him five times without any griping, and much to his Satisfaction. The day after, he began an Infusion that was preparing for him, from the beginning of this Course, whereof this is the Form.

R. Rad. Gentian. 3℔. Aristol. rotund. 3ij. summit. cent. min. absynth. Card. Benedict. ana M. ℔. Fol. Cochlear. hortens. M. ℔. Cortic. Aurant. baecar. Juniper. ana 3iij. præparatis s. ana affund. Vin. Xerensens. ℔iv. ac macerent. per dies quatuor vel

quinque dein bibat cocbl. iv. bis terve quotidie, infusio, vero, tantum coletur tempore usus; ac persistat in hujus infusionis usu ad mensem integrum.

HE drank this Tincture the whole time, as order'd, which dissipated his Fears of dying suddenly, and brought him easy Nights.

Observation XXVIII.

Observation
XXVIII.

K—B— of the— was troubled with a *Heat* in his Yard, after an impure Copulation; which very soon appear'd in a Running, and that but very small at first; but increased daily, and was of a *green* Colour; he had a *chaude Pisse, une chording Pain* of Erektion was very great.

WHEN I gave this Observation, in the former Editions of this Book, my Reader was only inform'd, that my Patient was cured altogether by a Method different from the common Practice;

tice ; which I was under a Promise not to communicate for some time, and that I then design'd to give a better Method of curing a *Gonorrhæa*, and of Shankers, with all the other consequent Symptoms of a Swelling of the *Testicles*, the *chord-ing Pains*, &c.

AT that time, I contented myself with proving, that the *Matter* of the Running, was neither the Liquor of the *Prostata*, nor of the *Vesiculæ Seminales*; but from the *Yard* itself. I then believed, that the *Running* was the Matter of an *Ulcer*: But since I have made it evident, to a Demonstration, that the Running is the corrupted Liquor of the *Lacunæ*, and of that more particularly, which is just beyond the *Glans*. From the good and ill Practice of all the former Methods, the Cure was obtained, and all the mentioned unhappy Symptoms were produced. Besides, that all the Methods were founded upon false Principles, which occasion'd the Danger and Uncertainty of the *Success*. Some

Authors imagined, that the *Running* was an exuberant Quantity of *Seed*; which Notion induced the first Physicians to treat it with Specificks that might put a Stop to the great Quantity: This was the first Foundation for *Diuretick* Ptifans, so much in use among the *French* to this day. Others, upon the same Scent, more particularly employ'd *Cassia*, as a great Specifick in redressing the Suffering of the *Kidneys*; for, at that time, the Disease carry'd the Name of the *Running* of the *Reins*, and the *purging* Faculty of that Medicine had an Effect, which was not owing to their *Theory*.

BUT as I have dispell'd those groundless Notions; I had shewn how far their imagined Methods can be of any use, and in what Circumstances they are ever useful. Now as all this is minutely determined in my Book of the *Nature and Cure of a Gonorrhœa*, I should, without Necessity, swell this History, or render it obscure by a short Account

count I must give on this Occasion ; especially, that my Book has been read by every body for some Years.

BUT before I leave this Subject, I must take Notice of an unworthy Aspersion thrown upon the Physicians in *England* by Dr *Astruc*, one of the *French King's* Physicians ; Physician in Ordinary of the Serene Prince Duke of *Orleans*, and Professor of Physick in a royal University in *France*.

THIS Author, in his Book of *Venerreal Diseases*, printed this Year, giving an Account of Dr *Turner's Syphilis*, says, the Doctor treats in his first Part chiefly of the *Gonorrhæa*, and of the *Pox* in the last. In both, their *Causes* and *Cure* were copiously treated ; but in a confused Order ; not in that Method, at least, which can afford us any Light ; *and which we complain to be wanted in the Works of the English*. We must complain, on the other hand, that the whole Nation should be charg'd with the Faults of

any one Author, an Imputation not common among the *French*.

DR *Astruc* gives me better Quarters, and his only charge against me is, my concealing my *Injection* for the *Gonorrhœa*, and for curing the *Whites*, which he thinks blameable in a Physician, nor will he admit of my Reason for doing so. Besides what I alledge, nothing has been more common among the best Physicians, than their having Secrets, as I had occasion to prove some Years ago ; with that Success, that the late learned Dr *Freind* became my Convert, and believ'd that *Actuarius* had a Secret of *Hippocrates* against the *Plague*.

MY Treatment by the late Mr *Devaux* is more after the *French* manner, whom Dr *Astruc* allows to have been an ingenious Man, and a Person of Learning. He was a sworn Master Surgeon of *Paris*, and ancient Deacon or Master of the *Surgeons Company*.

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MR Devaux, in his *Translation* of the first Edition of my Book of the *Gonorrhœa*, speaking of the Sufferers by that Disease, adds, *For my part, pitying the Sufferings of so many People seduced by the Witchcraft of a Passion, almost, invincible, I believed I could contribute, indirectly at least, to their Comfort, by putting into the Hands of sundry Surgeons, who were not skilful in Latin, the Translation of an excellent Treatise of Dr C— in which the Author has, in a particular manner, gone to the Bottom, more than ever was done before, in his Enquiries into the Nature and Cause of a virulent Gonorrhœa, not doubting but that these Surgeons, who are depriv'd of reading the Original, will find, in the Translation, Notions capable to rectify their Theory, from which they may draw Indications, more just, for conducting their Sick towards the only View to which they ought to tend, which is to preserve them from the grievous Consequences of this fatal Contagion; which have been too often felt for three hundred Years, in all the Parts of the World.*

WAS

WAS the Merit of a Book to be supported by Authority, I might produce the Testimonies of some of the most learned Physicians in *Europe* in favour of the very first Edition of my Book. The famous and learned Professor *Boerhaave*, (*Vir*, as Dr *Astruc* very justly observes, *de re Medicâ optimè meritus, ac scriptis suis egregiis Orbi literario notissimus, maximam famam in Academia Lugduno-Batavâ sustinet; famâ tamen ipse major*) has often been liberal this way, and, for instance, declares. *Quid vero hoc rei est, quod Censorem me velis subacti operis? Putasne ignorare me non fiduciam bonitatis tibi deesse? Non sanè perspicio satis te ponderasse singula rerum momenta, nec tralaticia meditatione conscripsisse hoc opusculum, sed firmo Experimentorum successu feliciter fretum.*

I MIGHT even appeal to Dr *Astruc* for the Goodness of the Performance; because he no where calls it in question, and

and that he is, on all Occasions, a very willing and ready Critick on the Works of Physicians.

BUT as to the general Charge he brings against *English* Physicians, of their Defects in Method, and their Order of Writing, I shall only call in the Authority of the late Dr *Lancisi*, Physician to Pope *Clement XI*, to clear myself from being one of that Number: a Person who deserves well of all Physicians by his learned Works, as well as by recovering the Anatomical Tables of *Bartholomæus Eustachius*, that were lost for one hundred Years; a Loss lamented by Physicians and Anatomists, who were the more sensible of their Sufferings by the *Opuscula Anatomica*, and *de Dentibus*, the only Work of *Eustachius* the Learned possess'd.

THE learned *Lancisi* is the better qualified for a Testimony of this kind, that he himself is a most *elegant*, and a most *eloquent*, Writer, in his own
Language

Language especially, and whom, on that account, his Contemporaries compare him to his ancient Fellow-Citizen *Cicero*. This is his Opinion about the *Method* and *Order* of my Book of the *Gonorrhœa*.



Viro Doctissimo D. *Gulielmo Cockburnio*
Med. Doctori, & Societatis Regiæ
in *Britanniis* Collegæ Meritissimo.

Jo. Maria Lancisus, S. P. D.

LIBRUM de *Gonorrhœæ virulentæ*
Curatione abs te vir Clarissimus D.
Alexander Littel-John mihi reddidit,
tuoque nomine mandavit, ut citò legerem,
tibique candidè quidquid de illo sentirem,
recta & sine cunctatione perscriberem.
At vero, priusquam utrique morem geram,
plurimas tibi, viro pari humanitate, ac
doctrinâ referto, pro insigni hoc munere
(quo publica mea Bibliotheca ditescet)
gratias

gratias ago; immo non tantum verbis, quantum rebus ipsis cupio inposterum gratificari. Deinde jussis tuis obtemperans evolvi opus à capite, ut aiunt, ad calcem, & quidem summâ cum voluptate; versatur enim circa argumentum, si non omnino novum, novarum certè Observationum, doctrinarum, ac remediorum accessione per te locupletatum, utileque redditum; in quo præterea nec lucidus ordo, nec stylus elegans, quibus scripta nostra lectoribus maximè commendantur, ullâ in parte desideratur; ac proinde non dubito, quin, quod Tute in Epistolâ nuncupatoria asseris, datis alterius cujuscunque morbi symptomatibus, ejusdem etiam natura, iisdem plane modis, quibus tu ad Gonorrhœam pervenisti, facile erui, atque explicari inposterum possit. Habeo itaque quod non tibi solum gratuler, sed etiam universæ Medicorum Reipublicæ, quippe quæ ex unico volumine omnia, vel de natura, ac sede hujus mali utiliter hauriet. Sed judicium hujus Commentarii frustra ab aliis expetis, cum tu magno ingenio, præclarâ eruditione,

eruditione, assiduoque usu donatus tum scribendis, tum expendendis libris Judex præ cæteris sedere possis.

Accipe interea specimen hoc cum benè auspicatæ nobiscum amicitiae, tum candoris mei, & Rem Medicam doctissimis tuis laboribus locupletare perge. Vale.

Romæ Idibus Januarii,
MDCCXVII.

THUS I have run over, with some Exactness, my *Disquisition* into the *Marine Diseases*, and the *History* of those in the *Fleet*, which, I doubt not, will correct many Errors and Mistakes in that Affair, and contribute very much to the Amendment of others that abound, in this Branch of the Navy.

The End of the Second PART.

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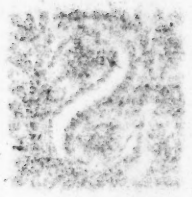


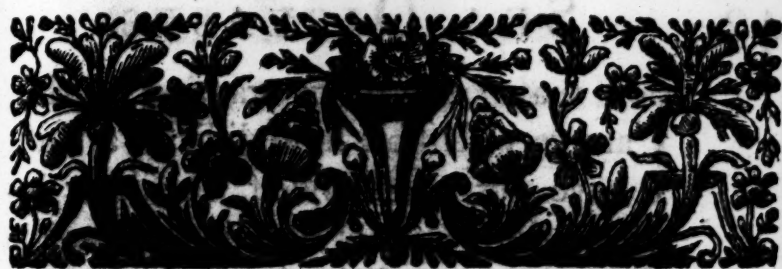
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REEDING

And the Government of the District of Columbia
has in its possession the following
Periodicals

THE NATIONAL ARCHITECT
and
The National Building
to be for in the District of Columbia
and also in the District of Columbia
and also in the District of Columbia





A N
E S S A Y
O N
B L E E D I N G,

And the Quantities of BLOOD to be
Let in FEVERS, in any of their
Periods.

SINCE my Observations in
1696, were introduced with
an Essay, concerning the
Quantity of Blood necessary
to be let in Fevers, I will continue the
same, and give it here more compleatly,
that nothing material in the former Edi-
tion

The Defects
of unassisted
Observation.

tion may seem to be wanting in this. I am very sensible how difficult a Task I have put upon myself, and how intricate the Times of Bleeding are, as also the Quantities of Blood to be let in those Times. In this, the Defects of single Observation are very notorious, when its utmost Improvement in this obvious Case, can give us so little Assistance in Practice; since, after all our Experience, we are left at large to judge Bleeding in Fevers *useless* or *indifferent*. This is plain by what was said, p. 125 in Part II. at least, by all our Observations, we cannot determine when it will prove useful and when fatal, it being very evident that it sometimes does great Good, and at other times great Mischief; In some *Epidemical* Diseases all die that are bled; in other Seasons, Bleeding has been very useful. There, ~~being~~ therefore, Cases when Bleeding is useful, and when fatal, but no manner of Observation that suggests when it will prove either. It is manifest how little a way single Observation can conduct

duct us, since in this plain Case it is so defective.

WHEREFORE I shall endeavour, in this Essay, to explain the Times of Bleeding, and the Quantities to be let in all Fevers as far as our present Subject will permit. To do this with greater Exactness, it would be necessary to trace this Affair of Bleeding from its Foundation, and to apply those abstracted Notions as particularly to *Fevers*, as their Circumstances can require: But the first being almost compleated by the learned *Bellini*, and the Nature of Fevers being not sufficiently inquir'd into in this Treatise, (because it requires no such Exactness) neither is it proper to determine this Affair so particularly at this time; yet, this Subject shall be consider'd as minutely as these general Accounts do allow.

To keep up to the Model of my former Essay, we must consider the various Methods that are gone upon to help our

What Methods there are to ascertain its Practice.

Bleeding a
principal
Considera-
tion in Fe-
vers.

Practice of Bleeding, by which it will appear, that Physick stands more oblig'd to the great *Bellini* in this, as well as many more Particulars, than to all other Physicians ancient or modern, and that a little more had compleated this Subject in every respect. But considering that many People, at present, as well as in former times, have been inclined to discontinue this excellent Administration, because of the mentioned Difficulties and Inconveniencies they found sometimes did attend it: I shall first put them in mind that *Bleeding* claims a chief Consideration among other Evacuations, that are necessary for the Cure of *Fevers*: For they being necessary, this is the most compleat, and the most simple Evacuation, *b. e.* it is the Evacuation by which we have the Quantity we demand with the greatest Certainty, without inducing Parts of unaccountable Operations to be mix'd with the Blood. Now that to evacuate is the first, and constant Design for the Cure of a Fever, cannot be denied after this general Account

count of Fevers I have given ; especially after what is said §. 53. Part I. and therefore the Evacuation by Bleeding best deserves our serious Consideration, notwithstanding of the mentioned Difficulties. But were these good Reasons for the pretended Desuetude, as if it were too dangerous ; then all *Evacuations* and Methods of Practice should be discontinued, since they are pressed with the same, and greater Difficulties. The Uncertainty and Danger of *Sweating* Medicines, of provoking *Urine*, the doubtful Administration of *Purgatives*, or even of *Lenient* Purges, and the precarious Use of *Acid* and *Alkali* Medicines are enough to throw us into such Despair, as rather to leave our Patients to the Strength of Nature, than that they should perish by rash Attempts intended for their Safety.

THIS being premised concerning the Benefit of *Bleeding*, and that the Time and Use of it may be made more clear, and the Reasons of the Cure more

R. 3

evident

Rules for
Bleeding.

evident than by any other sort of Medicines, I may justly proceed to enquire into these Rules that are to be found on the Records of Physick for our Direction in practising Bleeding with the greatest Safety. These are, 1st, That Blood may be let in any Quantity, till the sick Person faints away. 2dly, Till the Colour of Blood is changed from worse to better, from being black till it is red. 3dly, Till we take away enough. 4thly, To take such a Quantity that the Strength of the sick Person is not impaired. Lastly, till the Fullness of the Vessels is depleted.

The first
examined.

As to the first of them it is manifest that by this Rule, there is little Regard had to Diseases: For, the Design in Bleeding is very often to increase the *Velocity* of the Blood, and that in *Fevers*; which cannot be perform'd by following this Rule. 2dly, By *Revulsion* and *Derivation* the *Velocity* of the Blood is more increased in one Part than in any other, especially in time of Bleeding;

Bleeding; but these partial Velocities of the Blood may be caused without this Rule: Nay, they could not be, if this Rule was observ'd; and therefore it is evident that this Rule is so far from directing our Practice of Bleeding, that many good Effects, commonly obtained by Bleeding, would be impeded by observing it: Lastly, This Rule is very useless for Bleeding, since some People faint away at first Sight of their Blood, or of the very Lancet, while some others can bear the greatest Part of it to be let out before we arrive at the Mark of having enough, according to the Rule.

It is supposed that this Fear which hinders the Bleeding, produces as good Effects upon the Blood by altering its Motion, inducing divers Fermentations and the Variety of Changes that may happen that way; and consequently the Effects of Fear may be as great, as those that would have happen'd by Bleeding, *ad animæ deliquium*. No

doubt in some Cases it may: But this does not make our Rule compleat, except it will answer all: Yet it is very certain, that we are short of our Design, if it is to lessen the Quantity of the Blood, or to increase its Velocity, and as these are the most considerable Effects of Bleeding, but not obtained by reason of this fainting away, it is evident; that this Rule for Fainting is imperfect, whether that is occasion'd by *Fear*, or a *Loss of Blood*.

And the second.

THE Directions of the second Rule are much more distinct, and have a better Appearance of a Rule than the other. Yet, if we are only to bleed, when the Colour of the Blood is degenerated from its Redness, this comes often to be omitted in many Cases wherein Experience has shown it useful. For instance, we find how sudden, and what great Relief is brought by Bleeding in *Apoplexies*, in a *Mania*, *Melancholia*, and often in continual *Fevers*: Tho' the Blood, in these Diseases,

eases, seldom loses its red Colour, but oftner has a redder, and therefore by this Rule, we ought never to bleed in such Cases, otherwise than we are taught by Experience. Moreover, when a Man of the best Habit of Body, whose Blood may be in the justest Proportions of Quantity and Quality, has had a Fall, Bleeding ought not to be perform'd, or at least not till some Change has happen'd to the Blood; by which Neglect, we forfeit all the Advantages daily Experience shews us do attend Bleeding, and fall into some of the Inconveniences of *Rheumatical* and *Pleuritical Pains*, *Fevers*, *Imposthumes*, *Apoplexies*, &c. which follow upon its Neglect: So that, both for preventing and curing, *Bleeding* is necessary in many Cases, without ever considering the Colour of the Blood. 'Tis true, good Blood becomes bad thorow the Neglect of Bleeding; but then this Rule does not direct it, because it is red long after it has begun to degenerate by the Omission; whereas, if the
Person

Person who has fallen is let Blood, all this may be prevented : For by Bleeding, the Quantity of Blood is less, and its Velocity increased ; and therefore this less Quantity, circulating faster, does not so readily stop in the Vessels, compress'd by the Fall, as when there is a greater Quantity of Blood endued with less Motion, and stopped by Vessels that are contused ; and therefore Bleeding, when the Blood is red, and in the best Condition, is necessary ; tho' we are not directed to perform it by this Rule.

By the bye, it is only from these Circumstances in a Fall, and as Parts of different Operations are affected, that the great Variety of Symptoms, ever observed, are produced ; and tho' they are the most grievous both as to Pain, and Danger of Life ; yet it is manifest, to a considering Person how *Incisions, Amputations*, and Operations of the like Nature ; are the possible Cure of such Affections in their greatest Extremity.

BUT

BUT if we are only to bleed, when the Blood is discolour'd, and till such time as it requires the Colour that is natural: It is certain, that in most Cases, we might drain the Body of all its Quantity sooner than compass this our Design; for besides what we may observe in the Experience of Bleeding, it is not unreasonable to believe that the Blood does not much differ in degrees of Illness, in every part of the Body, and then our Rule becomes dangerous. We know that Blood may be wonderfully chang'd in its Qualities by bleeding, and some considerable Change may appear, in different Parcels of Blood of the same letting: Yet since the Causes of these are sufficiently known, we are not to draw any Advantage, to this Rule, from so rare Experiences; especially since the true Reasons can be assigned; besides, it were inconsistent with what I have already shewn from more undeniable Principles. All that can be concluded is, that as discolour'd
Blood

Blood is defective in some of its Qualities, and since that its Colour may be mended by Bleeding ; we ought to enquire diligently into the Nature of Bleeding, that we may know those useful Circumstances. But since Blood of a good Colour is sometimes to be let, these two Considerations together may sufficiently convince us, that the Foundation of this Rule is weak and precarious.

What our
Opinion is
of the third.

THE next Rule is so palpably indetermin'd, that it is a wonder how it ever came to be set up as a Standard for Bleeding ; for if we are to take enough, and this is the Mean of two extreme Quantities of much and little ; it is very manifest, that there is another Rule necessary to direct this in its useful and practical Part, and there must be as many Opinions about this *Enough*, as there are other Rules, and Physicians maintaining them singly, or in part, and that in all the emerging Cases in every Disease. It is not improbable

probable but that *Galen* thinking on the Confusion that arises on such Considerations fell into this Expression: Happy is the sick Person who lights on a skilful Physician, or whom Fortune, or Almighty God rather, thus favours, as to make the most useful Opinion to prevail.

THE Rule for Bleeding, till the Of the Strength of the sick Person is not im- Fourth. pair'd, is indeed more particular than any of the former, but as difficult to be discover'd as any of them. For, tho', in general, it be certain that the Strength of the sick Person is not to be lessen'd, it is as certain, that Bleeding is often necessary when we are under no manner of Suspicion of weakening our Patient by it: But if this were not so, the Difficulty how to bleed, and not impair our Patient's Strength still remains. What I formerly said, concerning *Revulsion* and *Derivation*, is a very good Instance, in the present Case: For it is evident, at one View,

View, that the little Quantity to be let will not endanger the Patient's Strength; yet this Rule does not instruct us, when, and in what manner, either Revulsions or Derivations are to be perform'd. Next, if we did suppose that Bleeding were useful in all, or most Cases; and no Caution else was to be regarded, but the Strength of the Patient; it is certain that this Difficulty occurring on all Occasions of Bleeding, cannot be of sufficient use till such time as a Method can be found, whereby we may avoid this impending Danger, and that before Bleeding is perform'd. For if we will preserve our Patients by *Bleeding*, and not run them into any Danger of Life; we ought to find a way, how this Rule of not impairing their Strength may be put in practice, and that on every individual *Person*, in every *Disease*, in every *Condition* of that Disease, and according as they are affected with other Circumstances; which is impossible to perform by this general Order, and more than this was
never

never attempted, but by the great Physician *Laurent. Bellini*.

THE last Rule is taken from the *And of the Fifth.*
Largeness of some Men's Vessels more than of those of another, or of this *Largeness* in a Man, at one time more than at another. This extraordinary *Largeness* they suppose to be the Difference of Blood in one Man and in another, or in the same Man at different times; and therefore that this extraordinary Quantity may be discharg'd, which is known to be done, when the Vessels have acquir'd their former Size. But this Rule labours under all the Difficulties we meet with in the former; besides others that are peculiar to itself. For, by what I have said in the first Part of this Book; it is evident, that they who have the largest Blood-Vessels, may have the least Blood, and may be the least able to bear its being let out.

MOREQVER

The Quantity of Blood may be augmented by Bleeding.

MOREOVER, it is very possible to augment the Quantity of Blood by bleeding, and therefore instead of lessening its Quantity till the Vessels become lanker, we may enlarge those Vessels by augmenting the Quantity of Blood, and that by bleeding, and in 24 hours time. The Reason of this, which may be gather'd from what I said in the first Part, does sufficiently account for *bloody Sweats*, especially in Children and delicate young People. An Instance of those we read, in p. 193. *Philos. Trans.* N^o 109; Another of those is that sent to the Learned *Valisneri*, Professor of Practice in the University of *Padua*, and by him transmitted to me, September 1716.

An Account of an extraordinary Plethora.

BUT the most notable Confirmation of both these Instances is the *Plethora*, I communicated to the *Royal Society*, 1705. In this Case, the *Arteries*, as well as the *Veins*, were so much stuffed and filled with Blood, that there

there was no room left for continuing its Motion: Yet very seldom was bleeding found to be safe in this Distemper, and a great many dropp'd off in time of the Bleeding; but if they escap'd that time, they grew weaker and weaker till they died, and then were found full of Blood. This Disease has been very frequent, these last two Years, in *Europe*, and out of *Europe*, and very fatal, but the Cases of such Misfortunes that happen'd by bleeding, cannot fairly be related at present. Yet the Case of the last Person, of any fashion, who died of this Disease, being pretty well known, and a great Confirmation of what I alledge, it will not be improper to relate the Substance of that Matter. It is known that the time from his first Complaint till he died, was not above three Days, in which time he was bled largely, and had other Evacuations; besides that, he took little or no Aliment, yet he was sensibly worse and worse, When he was opened, the Blood-

S Vessels

Vessels of the Brain were full as in Cases of *Apoplexies*, tho' he had no Symptom of that Disease, and the Vessels in other parts of the Body were in the like Condition, but they were not so narrowly examined. And therefore if there could be a Fulness that occasion'd Death, notwithstanding of great Evacuations, it is manifest to how little purpose they were made, and that an extraordinary Quantity of Blood was generated in time of these Evacuations, if not upon their Account.

To know
the Times of
Bleeding, a
Matter of
Importance.

OF how great Moment, then, is this Matter of Bleeding, but with what inextricated Difficulties does it stand incumbred? How useful and necessary is it to be believed by some, who think it so safe in all Cases, that it can never do any hurt? How unjust are the Calumnies of others who declare it to be always hurtful, and in no case proper? But howsoever useful and simple an Operation it is known to be; how defective are the Rules for administering it, since our Lives can be brought

brought to a Period by it, even when we have the greatest Quantities of Blood in our Bodies.

THE great *Bellini* is the second Person who enquired into this Affair, in that manner we find it done by him; and if the Excellence of his Performance is consider'd, we may say, that he is the only Person who has treated on this Subject reasonably: Infomuch, that any one will be perswaded that he wanted only more Time, or more Tranquillity in his Studies to perfect the rest, he having been often crucified with the Malice of impudent Tongues. His Performances in this Matter are so considerable, that they want only to be known, in order to their being admired. He has shown all the Advantages that can accrue to us by *Bleeding*, as also the great Mischief that may arise by it: He has evidently demonstrated, that the Velocity of the Blood may be increased, as also that it may be lessened by *Bleeding*, and the Causes of both; that in

Bellini the only Person who has done any thing tolerable on this Subject.

different parts of the Body, the Velocity of the Blood is different in time of Bleeding, and for some time thereafter: He has shown how the Body is warmed, and cooled, by bleeding; besides a great many more Particulars that were not thought of by any one before himself. All these are perform'd with such Evidence, as no body can resist their Truth who does not deny common Sense, and the Circulation of the Blood. His own introductory Words are, *Doctrina mittendi Sanguinem pendet ex toto à Naturali ejus Fluxu, seu Circuitu, intra Corpus: Adeoque supponendum id, omne, quod ostenditur de Circuitu Naturali Sanguinis.* The Doctrine of Bleeding wholly depends on the natural Motion of the Blood within the Body, or its Circulation; and therefore we must suppose every thing that is shown about the Circulation of the Blood, &c. Is not this an easy Postulatum for this his admirable Doctrine to turn upon? Who dares deny the just Consequences, from this Principle, and maintain *Harvey's* Circulation

P. 89. *De Urinis puls. Missione Sanguinis, &c.*

Circulation at the same time? or who can be thought to understand the Circulation of the Blood, who throws off the Doctrine of Bleeding by *Bellini*? For the future, let any Physician take heed how he reflects upon this Doctrine, unless he has a mind to declare himself a Disciple of Dr *Brown*.

HIS Doctrine thus demonstrated, How far he has carried it. upon supposition that the Powers of the Heart and Arteries are not weaken'd, is absolutely true: But when this abstracted Doctrine comes to be put in practice for curing individual Men of Diseases, or preventing their falling into them: in that Case, the Powers of the Faculties are already strangely impaired, and are capable of being more by *Bleeding*; and therefore there is something still wanting for the proper executing this abstracted Doctrine. In order to this, he is of opinion that we may compass it, by discovering the Quantity a Man may lose while he fasts, and has not these Powers likewise weaken'd, or the Quantity lost, by Transpi-

Transpiration, while no Aliment is taken, and the Powers of the Faculties not impair'd, nor he does not fall sick; and by other such like Means.

Prop. II.

BUT it is plain by what is said in the first part of this Book, that what is judiciously offer'd will not answer our End; neither are the Errors of this untimely Administration to be remedied, by *Broth*, *Cordials*, or the like Helps. Moreover, this learned Author observes most judiciously, that when the Blood is so corrupted that our Strength is impaired, it is the same thing as if the Qualities of the Blood remained the same, but its Quantity were lessen'd to that degree, as is fit to produce the like Defect of Strength; and therefore it is evident, that the *Bleeding* must always be managed with respect to the present Degree of Strength, whether that is reduc'd by the Quantity of Blood being less than it ought to be, or that its Qualities are so changed, and the Blood so much corrupted, as to produce the present Degree of Weakness. So that till such time as we can discover the Way how this Weakness is occasion'd, or at least the Degrees of this Weakness; there is something wanting

wanting to render this Practice complete.

THIS is the only Difficulty left unsolv'd by this great Man, and is candidly acknowledg'd by himself. *Prop. 42. Opuscul.*

Cæterum ut habeatur certa quædam cognitio ad quem usque terminum virium redigi possit animal, h. e. ad quam usque immixtam quantitatem Sanguinis absque necessitate alimenti, & absque eo quod veniat in imbecillitatem virium, quæ ab operationibus illum cobibeat, est ulterioris operæ, & unde res tota Missionis Sanguinis multo validius evincitur. But to know certainly to what degree of Strength an Animal may be reduc'd, *h. e.* what Quantity of Blood may be let, without the Necessity of taking any Aliment, or that he becomes so weak that he is not able to perform his common Actions, is a Matter of farther Enquiry, and from whence this whole Affair of *Bleeding* may more clearly be known.

'TIS true, he promises to hint something by and by, which may help us in this Particular, but I nowhere find it, so that this Matter is left with this Defect.

WE cannot sufficiently lament the Loss of this great Man, who had certainly

tainly clear'd this Difficulty, and render'd this Subject compleat: For my part, I hope this may be sufficiently remov'd by what I have said, *Cor. Prop. 2. Probl. de defibus emeticorum, &c.* And may be further shown in due time; but never with that Elegance of Expression that was natural to the great *Bellini*.

How this
Doctrine
may be de-
monstrated.

THE next thing to be done is, to apply the Doctrine of *Bleeding* to the present Subject of *Fevers*; which is an insuperable Difficulty, while the Doctrine of *Bleeding*, and Practice of *Fevers* were obscure, as the first was plainly before *Bellini*; and the second is, by what is said, p. 127, Part II; but I hope is now more clear, by what is shown in the theoretical Part of this Book, join'd to what is now said on this Subject. For, by them, we may know when our Design to *quicken*, and *lessen* the *Velocity* of the *Blood*, shall succeed in every Person *sick* of a *Fever*, in every *Country*, &c. As also, how the *Quantity* of *Blood* is *augmented*, and *lessened* by *Bleeding*; what Person is *warmed*, or *cooled* by *Bleeding*: Which is all we want to know.

F I N I S.

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